DOCUMENT RESUME

ED 077 501	JC 730 139
AUTHOR	Delgrosso, George M., Ed.; Allan, George E., Ed.
TITLE	The Pragmatics of Accountability (Philosophy into Practice). Proceedings: Annual International Institute on the Community College (3rd, Sarnia, Ontario, Canada, June 14-16, 1972).
INSTITUTION	Lambton Coll. of Applied Arts and Technology, Sarnia (Ontario).
PUB DATE	72
NOTE	234p.
EDRS PRICE	MF-$0.65 HC-$9.87
DESCRIPTORS	*Community Colleges; *Conference Reports; *Educational Accountability; *Educational Objectives; *Individualized Instruction; Learning Theories; Post Secondary Education; Student Development; Systems Approach; Teaching Methods

ABSTRACT

Papers presented at the Third Annual International Institute on the Community College are provided. In these papers, many facets of accountability are discussed: goal-setting, assumptions about learning, instructional modes, educational management practices, student development, instructional resources, and the systems approach. In addition, panel dialogues on "The U.S. College Scene" and "The Canadian College Scene" are provided. (DB)

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PROCEEDINGS

Third Annual International Institute on the Community College

June 14 – 16, 1972

Lambton College Sarnia, Ontario, Canada

The Pragmatics of Accountability

PHILOSOPHY INTO PRACTICE

Co-Sponsored By:

LAMBTON COLLEGE OF APPLIED ARTS AND TECHNOLOGY
and
ST. CLAIR COUNTY COMMUNITY COLLEGE
Port Huron, Michigan

In Cooperation with: Association of Canadian Community Colleges

American Association of Community and Junior Colleges

EDITED BY: George M. Delgrosso & George B. Allan

JC 730 139

FILMED FROM BEST AVAILABLE COPY

PUBLISHED by: Lambton College, Sarnia, Ontario CANADA

1972

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INTRODUCTION

G. M. Delgrosso, President, Lambton College, Sarnia

The First International Summer Institute on the Community College was held August 16-22, 1970 at Lambton College, Sarnia, Ontario Canada and St. Clair County Community College, Port Huron, Michigan. It was a pilot project initiated by Lambton College and co-sponsored by St. Clair County Community College with the cooperation of the American Association of Junior Colleges, the Association of Canadian Community Colleges and Eastern Michigan University. The conference was highly rated by those attending and it laid the groundwork for what has now become an annual International Summer Institute on the Community College.

The Second Institute was held August 19-21, 1971 with "Accountability in the Community College" as the theme. As a result of recommendations from participants that second year, the Third Annual Institute continued to focus on accountability with "The Pragmatics of Accountability - Philosophy Into Practice" as the theme. The intent was to explore some means of translating the precepts of accountability from words to actions.

In this selection of papers presented at the Third Institute, many facets of accountability are discussed: goal-setting (Baker and Brownell); assumptions about learning (Roueche); instructional modes (Postlethwait; Seshadri); educational management practices (Lahti); student development (Barrios); instructional resources (Teng); the systems approach (Gilley).

Additionally, the Institute continued to afford an opportunity for international dialogue on the community college through panels on "The College Scene" in Canada and the U.S. The paper on England's Open University (Lewis) describes an exciting endeavour to provide educational opportunities to a whole new clientele that could well be a model for community colleges.

Space limitations prevented the inclusion of the outstanding workshops presented at the Institute, notably "The Development of Instructional Software", presented by Franklin Winter of Sheridan College, Oakville, Ontario and "Individualized Instruction" by John Roueche. Neither was it possible to include several papers contributed by Institute participants.

As this is being written, plans are well underway for the Fourth Annual International Institute on the Community College. It is my hope that the Institute can continue to provide a means for study of the Community College movement, which, though internationally diverse, can everywhere share in the proud statement - "The purpose is people".

It is impossible to list all those who contributed so much to the success of the Third Institute - to them goes gratitude and appreciation. Special thanks must go to Roger Yarrington, Moderator of the Assembly, American Association of Community and Junior Colleges; Jacques Fournier, Executive Director, Association of Canadian Community Colleges; Richard Norris, President of St. Clair County Community College; the Institute Steering Committee; my co-editor, George Allan; and Shereen Robertson, Donna Stromer, Emile Arseneau and Bob McClean of Lambton College whose efforts made this publication possible.

G.M. Delgrosso

MINICOURSES FOR MASTERY

Dr. S. N. Postlethwait
Department of Biological Sciences
Purdue University, West Lafayette, Indiana

Thank you very much Dr. Norris. Ladies and gentlemen. I'm very much honored to have an opportunity to speak with you. As I sat there thinking about and listening to the talk about the history of this program, I just wondered how I had the gall to be here and face you and talk with you. I have not had much formal training in education. I am a botanist. I guess the reason I do have this fortitude if you please, is that I think I have in common with you an interest in "helping students learn". I guess the most important single characteristic of a teacher ought to be the desire to "help students learn", and so I assume that that's the reason we are here at this conference.

How delighted I am to be here and to see your fine facilities and to know that they are growing. I'm flabbergasted as I go about the country and see how quickly a new school can begin and begin bigger than any schools I knew back in the days when I was going to school myself. As a botanist I did my research in the development of corn, and you'll probably recognize that as the program continues. I was disappointed that you didn't mention one of my publications on a square-stemmed corn plant.

I began my career at the age of 18 in West Virginia, Hickory Knob, West Virginia - in a little one-room schoolhouse. I'll never forget my first day of teaching. I thought a good teacher should arrive before the students got there. I rushed up at 7:00 a.m. even though school didn't start until 9 o'clock. At 7 a.m. I was there and of course, no students. Then 7:30, no students, 8 o'clock, no students, 8:30 no students, 9 o'clock no students. Nine o'clock was the time you hand out books and I was very disappointed because I thought the students must have heard about me and I wasn't going to have any school. So 9:30, still no students. About 10 o'clock I looked down the hill and I saw a head sticking out from around a tree. I ran down and grabbed the student - I was going to teach, you know - and when I captured him there were about 14 other students waiting there too, and they had been watching me for quite some time.

It is a tremendous experience to teach in a country school. I recommend it to every teacher. I was at a conference in Ireland last fall and somebody was telling about this new and innovative way of teaching and it turned out to be a country schoolhouse. It was the very same thing in principle as we had in the country schoolhouse. I had at least one student in all of 8 grades and you know we had everything categorized: 3½ minutes for 8th grade arithmetic, a minute and a half for first grade reading and that sort of thing. I'll never forget one little boy that was there. I guess I was the first person he had ever seen outside of his own family and he taught me some good lessons. He didn't say a word. He wouldn't speak. I got him up on my lap and I pretended he was learning and that he was studying with me. I went right ahead teaching him even though there was no response from him. And after about four or five weeks he began to talk and he had learned everything that I had tried to teach him.

I also learned from a little girl, a lesson that I'll never forget. When I gave out my first report cards she came running up to me after she received hers and she said, "Hey look Mr. Postlethwait, I made an A". Well I knew she had made an "A" - I'd given it to her. But she was so thrilled that she wanted to tell somebody that she had been successful and that she had done something worthwhile and I think that speaks right to the very heart of this program. Everybody likes to be successful. This is exactly what we're talking about today and what you'll be talking about in this entire conference is a kind of system that permits everybody to be successful.

Well I can't begin without telling you my story which lays the foundation for what I would like to say. I learned this from Standford North, down at Oklahoma Christian College. He tells a story about a coach who was just about to win a football game. His team was leading by 6 points and they were on the 30 yard line. His first-string quarterback had been injured so he had sent in his 2nd string quarterback and on the first play he was injured. So he looked around the bench and he had a little boy there who he didn't know very much about and he said to him - "Come here son, we're just about to win a game. We've only 2 minutes to go and if you'll go in there and do exactly what I say, we'll win. I'd like you to go in there and do 2 quarterback sneaks and then punt. Can you remember that?" The boy said "Yeah, 2 quarterback sneaks and then punt." "Now remember no matter what happens, 2 quarterback sneaks and then punt. Alright." So the boy went in.
First play, quarterback sneak and he went to the opponents 40 yard line. Next play, quarterback sneak and he went to the opponents 2 yard line. Well, the next play he backed off and punted the ball. The boy came running off the field, and the crowd was yelling at him, everybody was upset and the coach was mad and came running out to meet him and he said, "What in the world is wrong with you - what were you thinking about?" And the boy said, "I was thinking - what a stupid coach.."

POSTLETHWAIT..cont'd

I think that a lot of us who teach can pretty well identify with that coach because anybody with any kind of gumption at all realizes that you adapt the container to the conditions. You adjust. But in education we know exactly how to teach. What do you do - two lectures and a lab? And it doesn't make any difference what the situation is, that's exactly how we teach. Two lectures and a lab.

A principle as old as the Bible itself is that you don't put new wine in old skins. We recognize this in every other area but education, but you know if I go back to West Virginia, I find there almost the same sort of arrangement for education as when I started. And yet we are the leadership supposedly.

I'm so happy that I was born when I was born. I guess you ought not want to be old, but because I was born when I was born, I've been able to see fantastic changes from almost zero - what our younger generation would consider zero - to going to the moon. Just fantastic. And I've been able to live through this and I'm so delighted. I think everybody would agree that changes are taking place; that those of us in education ought to be leaders; and that we ought to be making some changes ourselves. And so then the questions come up, "Well alright, I'm ready, I'm in education, I'll make some changes". Almost any teacher would say, "You give me $50,000 and I'll teach you a tremendous course." Well, I really don't believe that. You give a teacher $50,000 - I think he'd teach just like he taught before. I think a lot of us are like this old farmer - somebody said to him, "Zeke, why don't you go to College and learn how to farm better?" And Zeke said, "Oh, there's no use doing that, I'm not farming as well as I know how the way it is." I think a lot of us who teach don't teach as well as we know how the way it is and so to have more equipment and more of many other things would not change our approach.

Well if we don't start with $50,000 where do we start? I'd like to show my slides now, if I may, it's a part of my introduction. Well, I guess everybody knows what we ought to do in education. I'd just like to show you - the secretary knows how to teach, my wife knows how to teach, the janitor knows how you ought to teach, everybody knows how you ought to teach. And from a magazine, an electronic magazine, I have a special report in which they said they know how to teach. And in the 1970's, here's how it is going to be. They say here comes the tuned in, wired up, plugged in, hyperarticulate, speed-of-light society. Tomorrow's communications start with today's design. The goal is a communication system that replaces person-to-person contact. The tools - satellites, facsimiles, computers, telephones, microwaves. No more pencils, no more books, write and read electronically. Now all of this sounds just pretty tremendous. But I would say to you that if you look at what we see here on the bottom illustration, that in principle what you see is really not different than writing on the pages of a book. And with all deference to this gentleman, and I'd like to meet him sometime, he has developed about a $250,000. device for turning the pages of a book. And at Purdue University our students can turn the pages of a book and do it less expensively.

Now there was one paragraph in this whole magazine that made good sense to me and it said that the container should never be more valuable than the contents. Now I agree with this. If we're not going to start with a bunch of electronic gadgetry, then where do we start? Well, I suggest that we start with a typical ordinary common everyday type student like we have in the agriculture department at Purdue University. It's just like when we came to this place this morning. I found the typical, ordinary everyday type student standing out here to direct me and I appreciated it. Now, take that student, place him in appropriate surroundings, and surround him with the kinds of devices and materials that one can use to help a student to learn. This is what we've been trying over the past few years at Purdue.

Since 1961, we've been working with what we call the audio-tutorial system and it has finally culminated in the development of what we're calling mini-courses. Little courses if you please - the popular term is module. I guess it really doesn't make any difference what you call them, but little courses, unipacs, coursettes, or whatever you want to call them, you end up at about the same place. I'm suggesting that over the years, I guess back in the 1800's, they began to individualize college education by having courses and dividing subject matter into courses. And so I'm saying, alright, let's use that same system. That's a perfectly good system. Only the resolving power of a course in Biology 108 or Botany is not very high for individualization and so let's increase the resolving power by having little courses or minicourses, and so we're using the term mini-courses for what we're producing.

As I've made talks at a number of places, the challenge has very often been put to me that you go around talking about the lecture system and here you are, you give us a lecture. Well the fact of the matter is, if they would just read a little bit of what I've written, they would see that I think the lecture is a perfectly useful and valid tool for certain kinds of things. No question about it, many of us have learned through lectures and these are useful. But the challenge has reached the point where I feel I have to make some changes in my presentation. And so you people are the guinea pigs, unfortunately for you. A couple of weeks ago I made a minicourse on minicourses. But I've only had one opportunity to try this out. The course is designed for you to sit down in a booth somewhere with the materials and to put on headphones and to go through it. And in a large group like this I doubt that many of you will participate.

Last week in Hawaii (I get some tough duty you know) was the first time I had a chance to try it out and I couldn't stand it the whole way through, to tell the truth. And I haven't had a chance to shape it up since then. The feedback was not too great. But my point here is, that when we distribute the study guides to even a small group some of those people wouldn't even write in them. And the tape would say, do this, and they wouldn't do it. And so I would suspect that there will be some of you who will be non-participants here. I would hope that you would do what the tape requests that you do and then let's see how the thing works. Unfortunately I didn't have the wisdom to bring along a series of evaluations because I really need some feedback on this thing. I think that I'll be using it for the next few years and I would love to follow through as a good educationalist ought to, to get feedback directly from you. So I would appreciate, if at the end of the session, you could write comments and pass these along to me. This would be very helpful for the next people who would have to suffer through it.

I might just point out one thing about this accountability at this point. What you've just heard is a kind of defence that I have built up around myself when you're going to see the actual product. And this is the biggest deterrent to education in this mode. Because most of us have spent so many years in a lecture hall being able to say it and never having to face up to it again. But when you use this system, it lies right before you. Those of you who may be going into this accountability business, have only one dodge you can take. And that's the one I've taken. To say, "Okay, this is my best effort but I'm not interested in that - I'm interested in improving this until it's better and you as a team are going to help me improve this so that it is better". And that way you can live with accountability and development.

Oh, how difficult it was to realize when I began to produce these materials that the plant physiologist could learn literally what I taught about photosynthesis and a geneticist could learn what I taught about genetics. What an embarrassing situation. There were two alternatives. One was to learn more about genetics until what I did was acceptable and learn more about photosynthesis until I could do this acceptably. Which was an awful lot of work that I didn't want to do. The other alternative was to go to the expert and have him help me design it so that he would accept it and so that's where I am with you, you see. I'm saying to you, "Okay, here's a minicourse on minicourses - help me design it".

You see all these good looking girls around here with the red Study Guides in their arms - they are going to give you one of those in a minute. Actually this is a whole package that is produced by our minicourse development project and there is a Study Guide there plus an Instructor's Manual plus a script of the tape. Now I don't want you to use the script of the tape but directly I'll ask you to turn to some pages in the Study Guide. I found at the last session that they couldn't find the pages because I neglected to tell them there were 3 sets of materials there under one cover. So just start at page 1 and start at the beginning instead of starting at the back to find pages. Now I'm going to turn on the tape and you do what the tape says. Okay, is that what you're going to do? Shake your heads yes...If it says write something, write something alright? Well you can pass them out now...I told you not to look through it...just to lay it on the desk there..alright.. I believe most people have one so we'll begin the tape now if you please.

MUSIC. Hello there, pick up the study guide entitled "Minicourses - What are They?"* Will you look at the illustration on the back cover please?

Subject matter in colleges and universities is divided into courses. But courses such as a botany course are also divided into smaller units, concepts or topics as is shown here. Would it be possible to allow a student to assemble his own course in botany related to his specific needs? Well I think so - and this is the subject of this minicourse. Will you turn to the front cover please?

Here you see there are two authors. Frank Mercer and I are collaborating to investigate the nature of a minicourse with you. Now you will turn to page i please. Do you see the four headings here - Summary, Rationale, Prerequisites and Objectives? Well,look first at the Rationale.

The Newman Report and the Carnegie Report both suggest that new ways of going to college must be developed and tested. Will you turn to page 18 please? Why don't you turn off the tape recorder and have a quick look at some of the important points made by these two reports, okay? MUSIC.

Okay, now that you are back with me, let's get into the meat of the minicourse. Turn to page 1. What is

*Editor's note: The Minicourse Study Guide is reproduced at the end of this paper.

the history of the minicourse concept? Briefly, the audio-tutorial system began in 1961 in an attempt to make some adjustment for the diversity of backgrounds, interests, and capacities of students in a freshman botany course. Since that time, our ideas have undergone a lot of modification and evolution. If you were going to build an educational system beginning at zero, what are some fundamental considerations you would keep in mind? In other words, where would you start? Well, as in the picture, Figure 1, I would suggest that you start with the student and that you surround that student with the subject matter and the communication tools of that particular subject matter. Now it seems to me that communication tools fall into about four simple categories listed in the caption of Figure 1. (1) Tangible items - specimens, microscopes, experimental equipment. Now I know that it isn't very profound, but it just seems to me that if one wishes to help a student learn about plants, one ought to use plants as a part of the study program. (2) Printed material - text books, study guides, manuals, journal articles, etc. I think there is good evidence, even in this modern age, that these printed materials are very valuable components of any learning system. (3) Projected visuals - good judgement just dictates that there are some things that we can do well with 2 x 2 slides, with movies or video tape. A fourth category is audio input, whether it's in person, as in a lecture, or by tape or both.

Now I suppose I really ought to add a fifth category and that's a human being. No matter how elaborate we make a self-instructional system, using all the modern technology that is available, interaction of students with students and students with teachers will always be an important component of any learning system. In other words, a system may have self-instructional components such as audio-tutorial or programmed texts, etc., but human beings must be included as part of the system. Now look on page 2 please.

Given these simple communication tools, then what is my problem as an instructor? Again, it seems to me that it is relatively clear and simple. Look at Figure 2-1. I need to develop a program of learning activities, symbolized here as A, B, C, D, E, and F. In Figure 2-2, not just develop learning activities, but have these activities lead to defined goals, which I've symbolized at the right as 1, 2, 3 and 4. At Figure 2-3, I still have an additional responsibility and that is to develop some scheme which brings the student into contact with these learning activities, symbolized by that black line through the A, B, C and D.

Well how does one bring a student into contact with learning activities? Notice in paragraph three that Rudolph has recommended that a good learning situation is to place a student on one end of the log and Hopkins, a good teacher, on the other end of the log. Well I suppose that this is no problem if one has enough Hopkins' -- good teacher types -- and enough logs and few enough students, but for some of us who have hundreds of students, this model is impossible unless we use modern technology to give us a bit of assistance.

Well, you see in Figure 3-1 that the audio-tutorial system is a simulated Hopkins arrangement. A good teacher assembles the logs, then talks into a tape recorder as if he were talking with one student and the product, that is the logs and the tape, can be reproduced as many times as is necessary to accommodate thousands of students. When the student sits at one end of the log and the tape recorder on the other, this gives the student a simulated 1 to 1 relationship to the instructor. The logs that the teacher can assemble are whatever his imagination permits. 3-2. tangible items, the real plants themselves; 3-3. journal articles, textbooks, manuals; 3-4. any kind of projected materials; and 3-5. experiments done right in the context of the program. The most important component of this system is the teacher's capacity to identify learning activities and goals and for him to say the kinds of things into a tape recorder that would help students learn.

One very simple principle must be operative in the production of such a program, and that is - learning must be done by the learner - so the entire system must involve the learner in the process. Since there are no tangible items for this minicourse I'm trying to involve you or fulfill this principle by having you look at pictures, fill in blanks and that kind of thing.

Now in Figure 3, you see in each case, the student had the actual materials in hand, just as you have the Study Guide in hand at this moment. You should identify with the student at Figure 3-3 since the only tangible item in this minicourse is the Study Guide which you now hold in your hand.

I would like you to experience the activity illustrated in Figure 3-4, so look at Exercise 1 on page 3. The point I'm making here is that 2 x 2 slides can be used if and when desirable. Incidentally, if you don't have a projector, in Appendix 2 page 19, the slides have been reproduced in black and white so you can go ahead and complete the minicourse without a projector. We left much too much space here in the Study Guide; I just want you to write one sentence per slide, okay? So turn off the tape and do Exercise 1 please. MUSIC

Alright, we're back now. I can reinforce or correct your answer immediately. Slide number one was a photograph of an instructor making an audio-tutorial program and slide number two was a student sitting in the same location receiving instruction through the headphones using the same materials that the instructor used initially. Now turn to Exercise 2 on Page 4 please.

This exercise covers the same information we've already talked about. It is included here merely to show you that an alternate approach would have been to simply read this information. So read if you want, but I want to go right on to the next point at the bottom of the page - paragraph B.

Now, the audio-tutorial system laid the foundation for the development of minicourses and mastery at Purdue University. When Robert Hurst came to Purdue in 1969 we developed these next two steps. Now look at Figure 4. Dr. Hurst and I divided the content of the botany and zoology courses into small courses, or minicourses - about 30 minicourses in botany and around 30 minicourses in zoology. We have symbolized the pool of minicourses here for you in Figure 4-1 (not the precise number of dots are courses, by the way, just symbols). Now in Figure 4-2 we identified symbolically the minicourses for botany or BIO 108 and in Figure 4-3 the encircled dots symbolize the minicourses for zoology or BIO 109. Now notice that there are several (in actual number about 15 or 20) minicourses common to both botany and zoology. Well look at Figure 4-4. If a student completed all of the minicourses included within the 108 areas, at the end of the semester he was given four hours credit in botany or BIO 108, as symbolized by the line at the bottom with a 4 below it. If that same student took zoology the second semester, he was not required to repeat the common minicourses he had already mastered but could take enough optional minicourses to equal his four hours credit for zoology or BIO 109. All right, so much for that.

Now we've mentioned only two of the three important events in the history of minicourses. Will you look at page 5 please? Running parallel in time with the activities at Purdue University, there was a development in Australia which has contributed in a very major way to the state of the art and has had a very important influence on the development of minicourse materials. For a discussion of this project I would like the primary figure in the Australian development to discuss his work with you, and here he is, Dr. Frank Mercer. Frank!

Thank you Sam. I'll be delighted to chat a little bit about developments down under. So would you have a look at the map of Australia in the Study Guide? You'll find it on page 5. As you can see there, the map shows six of the Australian states and that one on the right-hand side with the concentric rings is New South Wales and the black dot represents Macquarie University in the city of Sydney. Now I would like to tell you a little bit about our effort to teach science to off-campus students.

When we started teaching in 1967, we didn't have many clues at all, so we sent out weekly correspondence material to cover the lectures and all the laboratory work was confined to residential schools on campus.

It didn't take us long to find out this wasn't the way to go; we wouldn't get the job done this way. We did, however, learn some of the problems and the important ones are set out there in the Study Guide.

Just glance at item A underneath the map. How can one take the professor to the student who lives upwards of 750 miles from the campus and whom the professor only sees in person for about ten days a year? So we had to find a technique other than straight correspondence.

Another problem was that off-campus students just couldn't handle a semester's lab work in four or five days of vacation school. And this was particularly true of any type of experimental work.

Then, and I think you'll appreciate this from B on page 5, our student body was very diverse, ranging from the 18 or 19 year old freshman on campus with his problems to the much older off-campus students with a different set of problems. You see the off-campus students were mostly married with kids, doing a job at the same time. Some were farmers and some were school teachers and many of them were married women who were retraining themselves for the day their family would be off their hands. So we were up against a far greater diversity problem than that found in the conventional university situation. And by the way you might recall that this was a major factor that motivated Sam way back in 1961.

And a third problem is what I've called the equivalence problem. I guess you know that a common criticism of correspondence teaching is that it doesn't rate with many university teachers. And this has been stressed by the Newman Report and you'll find a short quote from the report on the bottom of page 5. Just have a look at it. PAUSE. Now it was just this sort of criticism that made Macquarie opt for trying to give equivalent courses to all students, even though the students are not equal.

So there are the problems: communication, diversity of students, equivalent courses and lab work. Okay, we've got the problems, but which way do we go?

Oh, we have made one decision. Part of the answer must involve a self-instructional approach because we had to break up that big block of lab work in a vacation school. So we had to spread the load through the year. And towards this end we started to put together study guides and self-instructional experimental kits. If you would turn to

Appendix III, and you'll find that on page 20 of the Study Guide, you'll see there a makeup of a kit for seed germination and plant growth. (Plants are actually easier to use externally than animals, for obvious reasons). And there's a list of experiments that you can carry out quite successfully provided the student is given appropriate objectives and good guidance in a study guide. So the key really is studying the objectives, I suppose. Also we sent the off-campus students a microscope, reagents, glassware and other materials so that in 1968 we succeeded in having the off-campus student do quite a bit of his lab work at home.

Now it was about this time that I heard of the developments at Purdue. And it seemed to me that some kind of audio-tutorial approach ought to help considerably with the communication problem. That's problem A in your Study Guide there. You see if a student can learn in the audio-tutorial format while sitting at a carrel, and we know the off-campus students can do experimental work at home in his kitchen, so why not put the contents of the carrel in a box and package it along with the experimental materials and send the lot through the postal services. Why not?

So I wrote to Sam and asked whether he could come out and visit with us. Fortunately, this came off and so at this point there was a cross-fertilization of ideas, so to speak, and we both learned a lot from each other. And we adopted the A-T format where appropriate and also went ahead developing the experimental kits.

Experience with the portable package - you see it's now portable - in 1968 was most gratifying. The off-campus student learned as well as the internal ones, that's the on-campus student, at least as far as examination results as a guide. So much so that in 1969 we did a little pilot experiment using the off-campus material with the on-campus students. And mostly they liked this and this was one way we thought we might get around the problem of equivalence. You see, if both groups could use the same portable package, then they ought to be getting sort of equivalent treatment. And as I said, this worked reasonably well and we were going to have a much larger experiment in 1970, but this didn't come off because at that time plans were underway for myself and Dr. M. J. Mercer to come and spend a couple of years at Purdue. And also Dr. Heather Adamson, who has played a leading part in off-campus teaching at Macquarie, was going to the Open University in England for a year.

Now even back in 1968 when Sam was at Macquarie, there was talk of minicourses. Do you see there has been a parallel evolution? We at Macquarie arrived at a self-instructional solution to our problems with off-campus students and Sam arrived at a similar solution, that is, a self-instructional solution, for the on-campus students, but we did this by different routes. Now the sensible next step was to combine the two approaches and this is what's been done in this Minicourse Development Project here.

Well look, I think I've talked enough, so let me hand you back to Sam and he can continue with the rest of the story. MUSIC

Thanks Frank. Will you turn to page i please? Notice at the bottom of the page I've listed four objectives for this minicourse. We have just completed objective 1 - to be able to write a paragraph of no less than 100 and no more than 150 words discussing the history of the minicourse concept, including the three main historical events emphasized in this minicourse.

Well, objectives are a very important part of the instructional strategy we are talking about. And another point - objectives are for the students, not for the instructors. Now I had a choice of how to make you aware of this first objective and one way was to do as we have just done, have a look at the subject matter and then tell you that objective 1 was the one we were doing. Another alternative was to have you turn to page i at the very beginning of the minicourse, read the objectives and discuss them with you before the lesson. Sometimes we take this approach. However, where objectives are routinely used, the students pretty much automatically read the information on this page i before beginning the study. In any event, a good test question for these objectives will be a rewritten objective stated in a question form.

Now let's do objective #2. "Define the term minicourse". Will you turn to page 6 please? The nature of a minicourse, Exercise 3, asks you to compare and contrast minicourses with conventional courses. One might use a number of parameters for this comparison and contrast, and, as you can see, pages 6 through 10 include the parameters that Jim Russell has elected to use.

Well now, as your tutor I could take one of these approaches to this exercise. Number one, I could ask you to turn off the tape recorder, read these pages, and then write your definition. A second alternative is to read along with you and I might do this if it were a single, rather short paragraph, but since several paragraphs are involved, this would not be a realistic approach. And the third alternative is to call your attention to specific points that I think are of considerable significance, skipping along through these pages 6 through 10.

Well, I'm using the latter approach. I'd like to have you look again at the back cover. Do you see from this illustration that a minicourse is shorter than a regular conventional course and can be variable in length depending on the nature of the subject matter? Do you see here that it's a limited amount of subject matter which can be combined with other subject matter to total up a conventional course?

Alright. Look on page 6 at the paragraph entitled "Role of a Teacher". I'd just like to emphasize for a moment that the teacher, instead of being a disseminator of information, is a diagnostician, a prescriber, a motivator and a resource person. I would also emphasize the next paragraph, "Objectives". Objectives are stated in performance terms for the student. And I'd like to emphasize also that the student uses these for his benefit and guidance in his study.

Now look at the top of page 7, "Strategies and Media". The minicourse is not confined to this self-instructional strategy that we are now using. The concept is practical for use with a variety of instructional strategies.

Well, inasmuch as I feel that reading is still a very good way of learning things, I'm not going to talk anymore about the points made in these pages up to page 10. Will you turn to page 10, part (2). Take as much time as you wish to study the quotations and write your definition. Okay? Turn off the tape now and do that. MUSIC

I don't think I need to spend any further time with the definition of a minicourse. I hope you have checked the Glossary in the back.

Look at page 11 please. Perhaps you recall from page i that the third objective was to be able to list five ways minicourses provide for flexibility and individualization. Study the illustrations in Figure 6 and make a list of five or more ways minicourses can provide flexibility. Okay?

Now in Figure 6, the illustrations 1 through 4 you've already seen before, haven't you, page 4? So I'll not repeat the explanation here. Do you think you can interpret the other illustrations? Maybe I'd better do one. Let's do number 6 as an example. Remember from illustration 4 that 4 hours credit in botany was given to a student who completed the plant minicourses? Well, what if a student has mastered the content of some minicourses elsewhere - highschool for example? Well obviously he shouldn't have to repeat those, so X in the illustration 6 represents minicourses tested out of and those encircled are those that must be completed for that student to receive 4 hours credit. Okay? In other words, one might give a diagnostic test to all students at the beginning of the semester and then use this information as a basis to individually prescribe the minicourses to be completed during the semester. Now does that make sense?

Now number 12, by the way, is not an illustration, but simply asks you to think up still other ways. Now why don't you turn off the tape recorder and try to interpret the illustrations. Make your list and then check back with me in a moment. Okay? MUSIC

Alright. You're back. Now look at the illustrations 5 through 11. First, number 5. A pool of minicourses could make variable credit easy. A student might take a few minicourses for 2 hours credit instead of taking all of the courses for 4 hours credit.

Illustration number 7 is meant to suggest that a student might begin with a minicourse that is of special interest to him and pursue a pathway which is different from that of the other students. Some logistic difficulties arise in this alternative I can tell you.

Illustration number 8 is to indicate that one minicourse might be suitable for use in several courses. For example, a minicourse on light, if jointly prepared by the physics and botany teachers and its effectiveness validated, it could be used in physics, zoology, botany or any other appropriate course.

POSTLETHWAIT..cont'd

Now in illustration number 9 at the bottom of column number 2, I've attempted to illustrate that one might have several alternate minicourses covering the same subject. The student might choose from these the one most appropriate to his needs and interests. One might also have several minicourses treating the same subject at different levels.

Now in illustration number 10, I'm attempting to show that many minicourses may well be portable, and for those that are, the student might well study these in a dorm or even at home under circumstances that are adapted to his own needs. Now this thought is an especially attractive one when one considers the possibility of reducing total time spent in the formal classroom or on the campus and the ultimate savings that this might mean to education. Equal opportunity and continuing education become very real possibilities with this capability.

Now illustration number 11 is to suggest that minicourses might be exchanged among schools and even among nations, thus reducing the total cost of developing and testing materials as well as capitalizing on the expertise of individuals whose areas of interest are not commonly covered at all schools. Now in many areas of subject matter, it would be very difficult to transfer entire courses of 3 or 4 credit hours, but smaller units, or minicourses, can be exchanged with less difficulty.

Number 12 - I am asking you to think up ideas of your own.

Now turn to page 12 please. Just briefly, let's investigate the preparation of minicourse materials for use with the audio-tutorial instructional strategy. Will you do Exercise 5 if you wish or continue, as you please? MUSIC

Alright I'm going to assume that you wish to do Exercise 5. I've brought my film along with me, so I'm going to show it. I see there are a number of points that you want to raise.

(Question from audience) How do you decide the length and extent of a minicourse?

Postlethwait: I have not been able to put any strict parameters on this. Some people say a module should be 15 minutes long, but I think this is a mistake for us, because how long does it take you to learn how to use a microscope? It seems to me what we're dealing with here are topics. How to use a microscope - photosyntheses - respiration - transpiration and what have you. And so I can define this as concepts or ideas and some of those might involve two weeks, but some of them might only involve half an hour and so I would like that flexibility. The same kind of flexibility that we have in a course arrangement where you might have a one hour course or a two hour course or sometimes we have courses that are really continuous courses over two semesters and you lay them end to end because that takes all of that to make the whole. And so I would like to apply the same parameters to a minicourse.

Question: Where does the human element come into a program of this nature when a student who becomes frustrated after an hour or two, simply rips up his booklet or tears up his filmstrips and needs some contact with a human - maybe only to relieve his frustrations or maybe to help him get back in the right direction?

Postlethwait: You know this minicourse is not completed yet and that's why I wanted to show you this film which shows the personal contact that I think is a very integral part. This is a very critical point and I am more convinced as time goes by that the single most important component of any instructional program is the teacher. And so in every system that we design, the teacher must be an integral part. I think the film will show this. Now the unfortunate thing is that this film was made about 5 years ago before the minicourse design had been developed. Still the minicourse design fits into this format, so if you'll ignore some of the grade statistics in the film, the rest of it fits. FILM

The knowledge explosion and population explosion have created problems for both students and educators. Now communication devices have great potential to help alleviate these difficulties. At Purdue University a freshman course in botany has been restructured to incorporate the use of some of these devices into the study program. The restructured course involves three study sessions per week plus other specially assigned activities. The sessions are an independent study (unscheduled), a general assembly (scheduled) and an integrated quiz (scheduled).

The independent study is in a learning center which is open from 7:30 in the morning until 10:30 in the evening, Monday through Friday. The student comes in at his convenience and records the date and time on his record card, places the card in a numbered slot which assigns him to a booth and picks up a mimeographed sheet of objectives. The objectives are stated in behavioral terms and listed in the appropriate sequence for the weeks study program. Final arrangements to begin study are made by placing the headphones in position, starting the tape player and locating the textbook and study guide for convenient reference. There are 32 booths to serve up to 600 students. For each week's unit of study, all booths are equipped identically.

The audio-tape is prepared by the senior instructor in a conversational tone and programs a variety of learning activities. These may include a lecture introducing the subject for the week. The student can take notes if desired and when some point is not clear, or missed, segments of the tape can be replayed as often as necessary for clarification.

Experiments requiring only limited equipment and materials are done within the booth, but when this is not feasible, the student is asked to turn off the tape player and go to some central location for demonstration or an experiment. The experiment can be done at this location or the components can be set up and removed to the booth for periodic collection of data. This interruption in listening to the tape permits variation in study activity. But more importantly the experiment can be placed in the study sequence at a time when it's most meaningful. In addition, the orientation of the experiment is given on the tape by the senior instructor and at its conclusion the senior instructor's voice can pose questions and direct the student's attention to significant points regarding analysis of data.

Since each student is proceeding independently, there seldom is more than one student at a given point in the study program, so often only one or two pieces of equipment are necessary to supply up to 600 students. Now under the conventional system I'd have to have eighteen pieces of equipment. Experiments which are too complicated, or where it's not feasible to provide materials for 600 students, can be prepared in advance and all students can collect data individually and make an independent analysis. Likewise, demonstration materials can be made available at a central location. Again, as with the experiments, one set of demonstration materials will supply for up to 600 students. Each student can make observations first-hand and each can collect his own data.

Excursions from the booth result in many casual or deliberate encounters with instructors or fellow students. Problems may be clarified and questions answered at the time they arise, thus providing a more secure foundation for subsequent study. The senior instructor, spending the same amount of time as normally scheduled for the conventional course, can contact students in a more meaningful way.

On completion of each experiment or observation, the student returns to the booth for further taped tutoring by the senior instructor. The student's analysis of data can be confirmed or corrected and pertinent conclusions emphasized. The next learning event might involve the study of a live specimen. Or it might involve a microscopic study, using photographs and diagrams in the study guide. The illustrations are labelled coincident with the viewing of the original specimen through the microscope. The instructor on duty is available for immediate and individualized assistance.

Motion and color are provided through the use of an 8mm movie projector. 8mm film provides several important contributions to the study program. Instructions on how to perform some procedure can be viewed coincident with the manipulation of the materials. A student can view the first step in the procedure, turn the projector to hold, do that step, turn the projector to forward and view the second step, turn to hold and do that step and so forth. 8mm film can provide a time saving for viewing sequential microscopic sections. And time-lap sequences can be viewed in close association with selected specimens. Where it is not feasible to provide films at each booth, the films can be placed at a central location.

Study can be interrupted to accommodate the student's schedule or efficiency peak. If he cares to take a brief break, he can retire to the adjacent prep room where he can have a cup of coffee and relax a few minutes. Casual conversation frequently leads to a free exchange of ideas and information on the occasion of these breaks.

When study is completed, the student restores the booth to its original condition and ready for the next student.

'A' students spend on the average of 3.8 hours per week out of 4 hours under the conventional structure. 'B' students - 3.3 hours per week; 'C' students - 2.7 hours per week; 'D' students - 2 hours per week and 'F' students - 1.5 hours per week. The student removes his card, checks out and files his card to be used again on the next occasion of study.

The general assembly session is scheduled to follow the independent study session but precedes the integrated quiz session. No fixed format is maintained. The general assembly is used for those activities best done in a large group. It is an occasion for the presentation of a guest lecturer. The general assembly also provides an opportunity for orientation of subject matter for the coming week. An opportunity for review or emphasis of critical material from the preceding independent study session. To show long films, give major exams, help sessions or any other appropriate activity. Attendance is not required, except for special occasions.

The integrated quiz sessions terminates the weeks study. Eight students and an instructor are scheduled for 1/2 hour of oral quizzing and a 20 point written quiz. The instructors for these sessions must meet with the senior professor weekly to discuss and plan the details of the coming weeks session. Activities during the integrated quiz session follow a rigid pattern illustrated by the next few scenes of this film. First a statement of the overall objectives and orientation of the weeks work. Second, individual lectures by students selected at random by the instructor. The student's lecture involves first, identification of the item; second, relating the item to the appropriate objective; third, use of the item to illustrate his lecture. At the conclusion of the lecture and prior to correction or addition by other students, the student is assigned a grade of either excellent (9 points), mediocre (7 points) or poor (5 points or less).

While the next student to participate is selected randomly, the item to be discussed is taken in the sequence program in the independent study session. These supplementary contributions may result in the contributor's grade being raised one or two points at the conclusion of the session. Each of the students has an opportunity to discuss one or more items. On completion of the oral quiz, the eight students take a 20-point written quiz and are replaced at the oral quiz table by the next scheduled group.

In addition to the three study sessions, special efforts are made to provide personal contact and to emphasize the inquiry approach. The first meeting of the integrated quiz session includes 32 students and all are personally greeted by the senior instructor. All 32 students are photographed at this first meeting. Brief instructions are given on the use of equipment.

During the arrival time, students are assigned to the integrated quiz session and instructors in 4 groups of 8 each and a discussion of "What is Science" is begun. This discussion leads to the definition of a problem, the designing of an experiment to give relevant data and culminates in the setting up of the experiment during the last few minutes of the session. On completion of the experiment a few weeks later, a statistician will help analyze the data in one of the general assembly sessions. All 600 students are required to do the experiment, collect data and to write a paper. The paper is written in the format of an article for the American Journal of Botany, including references from the library.

A second project is required of all 'A' students. It begins with a conference with the IQS instructor. The initiative for the entire procedure is left to the student. The only restrictions are those imposed by time and facilities. This project too, must be written in the style of a research paper. Smaller inquiry experiments comparable to those commonly conducted in a conventional laboratory are included in the independent study session.

The photographs taken during the first meeting of the class are used to promote acquaintance among students and staff. The photographs are used on a seating assignment chart for the general assembly session, on an integrated quiz session weekly record, on the permanent record file and on check-in, check-out cards for the independent study session. Further personal contact is provided in two ways - a weekly coffee hour and an open house at the home of the senior professor once each semester.

In summary, the audio-tutorial system permits independent study but retains teacher-student contact as an important ingredient in the learning program. It has potential for adaptation to other subject matter areas as evidenced by its use in a graduate course in plant morphology and an undergraduate course in ecology. These two courses are taught simultaneously in one learning center.

Specifically, the audio-tutorial system provides: (1) repetition adapted to the individual students needs; (2) an opportunity for concentration - students are not distracted by the presence of others or disassociated events; (3) an opportunity for association - attention is focused on the subject of study; (4) each student has the opportunity to adjust the size of the study unit to his own ability to assimilate the information; (5) the use of a communication vehicle appropriate to the nature of the subject matter; (6) an opportunity for subject matter to be covered in a multiplicity of ways so the student can exploit the medium most effective for him and (7) an opportunity to integrate learning activities into a meaningful sequence of experiences. END OF FILM

Now I think the gentleman in the back put his finger on the most important single communication that I can give you today. I know that as you look at some of the devices that I used to get this job done, you may consider them pretty trivial, and maybe they are. But we can get so enthusiastic about the use of a tape recorder or about the use of TV or a whole series of technical devices that we forget we're dealing with human beings and lose the ballgame and sometimes that's just exactly what we do.

Now, this film came along at a time when I was very sensitive to this because many people were taking pot shots at me back in those days - "Oh, now you're using a tape recorder, what do you do with your spare time? You don't have anything more to do." Which just showed their total misunderstanding of what is involved in a development of a system, the feedback, the revision and this sort of thing, but also the idea of personal contact and so I tried to put this in. We tried so many ways. Some of them were ridiculous, but the photograph one is not.

As a matter of fact, I used to memorize the names of all 500 of my students. I knew the names of the students who didn't know my name. And that's lots of fun. As a matter of fact, I'd walk down a street and I'd see a student coming along and mentally I'd run up and down the chart and read his name at the bottom of his picture and I was in. I'd call him by name and that would shake him up and he'd turn around to see who is this guy. I used to go ten minutes early to the lecture hall and as the students came in, if I couldn't call their name I'd check it out, until I could call the names of all of my students. This is very important.

We can over-emphasize the significance of this though. I thought - all students want to be near me - this was obvious - and so I had this Postlethwait coffee hour. I thought to myself I'll advertise this well with free coffee. I didn't know how I would be able to pay for this much coffee for all 500 of my students. The first coffee hour there wasn't anybody there but me. And when we came to the point where we wanted to make this film, I had to run out and grab a bunch of students and say "Come in here and sit down and look like you're happy will ya". So you can over-emphasize personal contact.

Some people say "How do you have 500 students over at your house?" I didn't say we had 500 students out at the house, I just said we had an open house for 500 students. When we first began this, Purdue ran busses out to our house and it got so embarrassing, two or three students on a bus, that we had to cut this out.

POSTLETHWAIT..cont'd

Well you say, your students don't like you, but this isn't so. They really don't want to be buddies with me, but they like to have this opportunity. I told my students they could call me between 9 and 11 on Wednesday night and on Sunday night and that I would be by the phone. I'd be glad to have them call me. Well, sure enough, students called me, but what they'd do was say, "Will you open your study guide to page so and so", and I'd open my study guide you know, and they'd say, "Would you explain that to me again", so I'd explain it to them again and they'd say, "Thank you very much", and I'd say, "How've you been - it's been a hot day today hasn't it?" and they'd say, "Yes, thank you very much", and hang up. They were just not interested in this sort of thing as much as I was.

Well anyhow, the system must have these kinds of things in it. I've a little sign on my door - we have a number of visitors down our way - and it got to the point where I was sitting with people in my office when I should have been over with my students and I'd see students walking up and down by the office. I finally put a sign out there saying, "students have priority in this office - visitors will excuse us". And sure enough a student might only need 2 or 3 minutes, but the reason we ran the system was not for the visitor, it was for the student and so students finally would come in.

Well, what I'm trying to say is that whether or not you have personal contact is a factor of you and not of the system. And many people who say they want personal contact merely want to display what they know in front of a group like this. And talk to a large group. And if you analyze it, this is an ego-inflating exercise, in most cases and really doesn't do much. It's real interesting to me, of course, you're a good group. I just can't imagine this many people filling in and doing what I asked you by tape in an audience like this. You see that system is not designed for a large group of people and most of us have learned to be non-participants. And students have learned to be non-participants. And their first approach to this kind of a system is to let it run. You turn on the tape and they just let it run. Ultimately many students begin to learn that what they're trying to do is accomplish objectives, not to listen to the tape, and they begin then to engage in the learning activities.

Now those of you who did engage in the learning activities here, probably came into direct contact with some of the points I was trying to make. One thing I think that annoyed you was that I turned the tape recorder on too quickly before some of you were finished. And you said, "Why is he turning it on now?" You see, I had control of it. Now if we're going to adjust for the number of people here, what do I have to do? Provide some sort of vehicle where you have control of it, not I.

Now another point is I think,it is a human right to tear up the thing, to say I don't care, forget it, and walk out. Yet in a lecture hall, if you're polite, you're not going to just get up and walk out, are you? And many things that we have in other courses, not just in botany, are not worth our time. Just not worth our time. And most of us just don't want to waste our time. Students are a lot like people. They don't want to waste their time this way either. In the lecture hall they can't get out - but give them an opportunity to get out and you'll see what happens.

POSTLETHWAIT..cont'd

I have this general assembly session and for several years I operated with the general assembly session by saying everybody must come - it's a required session. So, I would talk to groups like this and they'd say well that's contrary to your original philosophy. You're saying write objectives, and let students learn, and that the objectives are important, not whether they come to general assembly sessions. So I said, well okay I've got to be consistent.

So go back and say to my students, you don't have to come anymore. I'll not require it. They'll come anyhow because it's me. And so I went back and said to a group of about 300 students. "Look, you're not going to have to come anymore to the regular sessions". Next week, what happened? Out of 300, I had about 30. Well, my reaction was, "Well doggone, that's the way with this younger generation, they don't appreciate some of the finer things of life and I'll just show them that there's something about me that radiates botany, and by being near me you get to learn about buds and twigs like you just never learn them anyplace else."

Well, I kept the data, I faked it in everyway that I knew how and there was no correlation between the grades and those who attended the sessions. So I just had to admit that it didn't make any difference. There were two alternatives; that what I was doing in the general assembly session wasn't what I thought I was doing, or that my evaluation was not assessing what I was doing there - one or the other. And so I gave up and I said to myself - "Well, I'll just be honest", and down in the learning center I put up a little sign - 'There will be some general assembly sessions that are required, and if I mark them required, students, that means you need to come because we're going to cover material that's not covered elsewhere'. That's a part of the minicourse if you please. And so that worked out okay. Three hundred were supposed to come - 300 came.

Then I checked another one highly recommended, and that communicated to the students that I was going to do something that I thought was real important so they ought to come and for this about half would come.

Then I had another session which I checked as a 'help' session which meant I would be up there doing whatever I could do to help them. Well, it is interesting to note what happened over time with that one. First time I checked it during a semester, everybody comes and I go in there and tell them my very best West Virginia jokes and I just smile all over the place you know, and try to make it look like it's going to be great, it'll just be tremendous - how can you miss it. And then the next session only about half of them come. The next session, less, and it just gets progressively less until well at the end of the semester I take them all out for cokes - both of them!

The only problem with this kind of arrangement is that if the schedule deputy comes along and you have a room that holds 420 students and I have 2 students in there, you go to him explaining this business of accountability. And say, well my students are learning, I'm accounting for them. He knows that students learn from lectures and if you're assigned a lecture hall they're supposed to be sitting in that lecture hall and they'd better be there. I tried to give it back one time. Went into the schedule deputy and said, "Look, I'm really not using this place and I'd like to give it back" - and he said, "You mean you're scheduled in here and you're not having your students come. Well Sam, you're dishonest". I said, "Oh forget it." I kept the place for about 3 years. I kept the place and didn't use it because I couldn't explain to the administration that my students were learning, and that I could show them my students were learning, but that the lecture hall vehicle that I had been given was not necessary to the learning. And so these are some of the problems.

Anyhow, you can have personal contact. When we're talking about a system design we're not talking about just this one facet of exposing them to subject matter - we're talking about the other aspects of it as well. And I'm saying to you that I think that a general assembly session can do lots of things and that they're very important components of most instructional systems and ought to be included here. We still have general assembly sessions and always will, despite audio-tutorial.

Well, we interrupted the minicourse and will not be able to finish it for lack of time. But as I watched you, there were two or three things that I noted down which I think are important. One is, this business of non-participants. As I said I'm flabbergasted at the number of you who participated in this. But if you're going to be a non-participant you might as well do it someplace else. I remember when I asked the Dean if I could open my lab and have an open lab so that the students could come in if they wanted to, and he said, "Sam, these are just freshmen, you couldn't turn your lab open like that - they'll never come in". I said, "Well Dean, the worst that could happen to them is they'd never learn any botany and they're not learning very much botany the way it is". So he agreed and it didn't turn out that way at all. When we opened our lab, what we were opening to were people, and these people were concerned about themselves and they knew that they needed to come into the lab the same as I did. Now, if you listened to the statistics, although these statistics don't apply now to our minicourse arrangement here, you heard that the people who got F's were only coming in about 1-1/2 hours and that's what you would expect, but that's a very low percentage of the total number of students that fell into that category here. A high percentage of them were perfectly responsible citizens and people who were concerned about themselves and their own growth. So there are participants and will be participants if we provide the opportunity.

The quality of sound was poor in our reproduction here and I don't think you can quite appreciate the impact that this had on how you operated here. We tried this out - we didn't do it deliberately, but we had a poor quality tape the first semester of last year and we were asking about the relevance of the content on a questionnaire and this sort of thing; the quality of the study guide and a whole series of things. And with the low quality tape the first semester, that particular minicourse got a low rating. The next semester we did only one thing, we just improved the quality of the recording. Didn't change any words or anything, just improved the quality of the recording and everything went up across the board, including things like relevance of the content, which hadn't changed. The quality of the illustrations was rated higher although we used the same illustrations. Everything was rated higher, with this improved quality of the tape.

Well now, I'm running out of time so fast I don't know how to say the other things that I feel I need to say. Let me just say that in the past three years we have not failed any student. There are students who have received incompletes. But those are students who just haven't gotten all of the job done. As we tried to indicate in our little diagram here, there are a pool of minicourses since a student is doing a program like this with objectives spelled out, we know when he has arrived. When he gets here for this one, we keep a record on him that he has completed that minicourse. When he does this one then he has completed that one and this one and this one. If he has not completed the total for BIO 108 we simply ask him to come back the next semester and complete that which remains, which may be one minicourse, two minicourses or three minicourses.

This caused real problems because we're holding for a C level, mastery is a C level for us. What percentage of 500 students would you expect to be incomplete? Well in the conventional arrangement we would have on the order of 20% or so that would fall in the D and F category and if that's the equivalent of those that would get incompletes - then 20% of 500 might be incompletes. And that's a pretty good bunch of incompletes to turn into the Dean. Dean called me and said, "Sam, would you come into my office when it's convenient?" And I said, "Yes sir", - I always say Yes Sir - and went right in. He said, "What in the world am I going to do with all these incompletes? Why can't you do like other teachers on campus - why didn't you just give them an F and then I'd know what to do with them".

Well all you'd do is recirculate these students through the same course. Well, you can't say 'stupid' but that's not a very intelligent sort of thing to do. When we ask our students to master these - and they'd mastered this one on photosynthesis, they'd mastered this one on how to use a microscope, they'd mastered

POSTLETHWAIT..cont'd

this one and they'd mastered that one - we can't ask them to go back through these again in order to get at these that they hadn't done. That just doesn't make sense and it didn't make sense to the Dean either and so somehow, the administration has worked out how to take care of these incompletes. And this is the kind of game we're in when we're talking about accountability, objectives and all of these. It is a new ballgame.

You've got some very distinguished people here to work with you who know so much more about these kinds of things than I do, and they will be talking to you about how to write objectives and all of this sort of thing. But just let me say that it's one thing to read it from a book and it's another thing to put it into the classroom. And when you start putting it in the classroom, there's going to have to be a lot of good common sense exercised somewhere.

I told my students they could complete minicourses whenever they pleased. The first semester was chaos - literally chaos - when we went to the minicourse design and the mastery concept. Do it whenever you please. You know what happened? They are a lot like people aren't they? I got some nasty letters from students, some of the nastiest letters you've ever seen saying, here I thought this was a tremendous system, and then the first week I didn't quite make it. And so I said, well that's okay I'll do it the next week. So the next week they did one and they were behind two. Oh, it's alright you can make it up anytime in this system, so the next week they were behind three and the next week they were behind four and the poor kids were just progressively worse off because the system caught them when they're not trained to operate in this kind of system. So you have to make some adjustment for them. What was the adjustment for them? Say look, you've got to get in here and get this done while it's there. It was just that simple. And it salvaged just quantities of students to say to them in this unstructured arrangement, here is the structure. You've got to do it when I say.

Along with that - there were 3 umpires talking and one of them said, "Well some is balls, and some is strikes, and I calls 'em as I sees 'em. The other one said, "Well some is balls and some is strikes and I calls 'em as they are", and the third one said, "Well some is balls and some is strikes, but they ain't nothin until I calls 'em." So you've got to apply some of this in all of our idealism for individualization and for self-pacing. Self-pacing has to be paced, if you please, if you're going to deal with the normal population of students. Now if we're talking about a different population of students than we normally get in a college then that's a different situation. But at Purdue University where we have many students that have the competition of chemistry and physics and all of these other worthless courses - how could you do chemistry when the botany is right here? Who could hate a plant?

Well, we are in a day and age where the potential for us is just fantastic. And I am totally convinced that to treat people right is to define what we expect them to learn and do it with objectives. Write them out so they know specifically what the objectives are, design systems to help them get there and for goodness sakes give them credit after they get there.

This has been our greatest problem. It's a big farce when you say, "Do these objectives", and when a student does them you write him a test that covers everything else except the objectives. Well, bless your heart, why don't you go back and use the other system then, and don't worry about using objectives. Your students are better off if you don't pretend. They are better off if you continue like you have rather than to say you accomplish this and then frustrate them after they accomplish it.

It's a tremendous time to be in education. The opportunities are so great for us to carry education to everybody who needs it and to everybody who wants it. Paradoxical as it may seem, there's nothing so constant as change. Wouldn't it be a paradox if those of us in education, the leaders in this world of change, were resistant to change. And yet there are few people on this whole earth who are more tradition-bound than a bunch of college professors.

I tell you, two quarterback sneaks and a punt! Thank you.

STUDY GUIDE

MINICOURSES - WHAT ARE THEY?

S. N. POSTLETHWAIT
FRANK MERCER

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Preliminary Version

Summary

This minicourse involves you in a brief study of minicourses as possible alternatives to the conventional unit of education (courses). A brief history of the minicourse concept is presented, and the nature of a minicourse is discussed. Various ways in which minicourses can be used are then explained, as well as the flexibility and individualization provided by this educational approach. Finally, you are given suggested guidelines for the development of self-instructional programs in the audio-tutorial format.

Rationale

Current educational procedures are undergoing critical reviews from several sources. The *Newman Report* and the *Carnegie Report*, among others, have recommended major modifications in our basic approaches to education. A common expression is *new ways of "going to college" must be developed and tested if we are to accommodate the increased widespread demand for equal opportunity education and continuing education*. A great many teachers are heeding this admonition and several innovations are being tried throughout the world. The minicourse concept has the potential of satisfying current educational needs while being compatible with conventional systems of education.

Prerequisites

There are no prerequisites for this minicourse.

Objectives

On completion of this minicourse you will be able to:

1. Write a paragraph of no less than 100 words and no more than 150 words discussing the history of the minicourse concept, including the three main historical events emphasized in this minicourse.
2. Define the term *minicourse*.
3. List five ways minicourses provide more flexibility and individualization than possible under conventional instruction.
4. Produce a minicourse following the guidelines included in this minicourse.

I. HISTORY OF THE MINICOURSE CONCEPT

A. The Audio-Tutorial System (1961)

1. Communication media (basic)

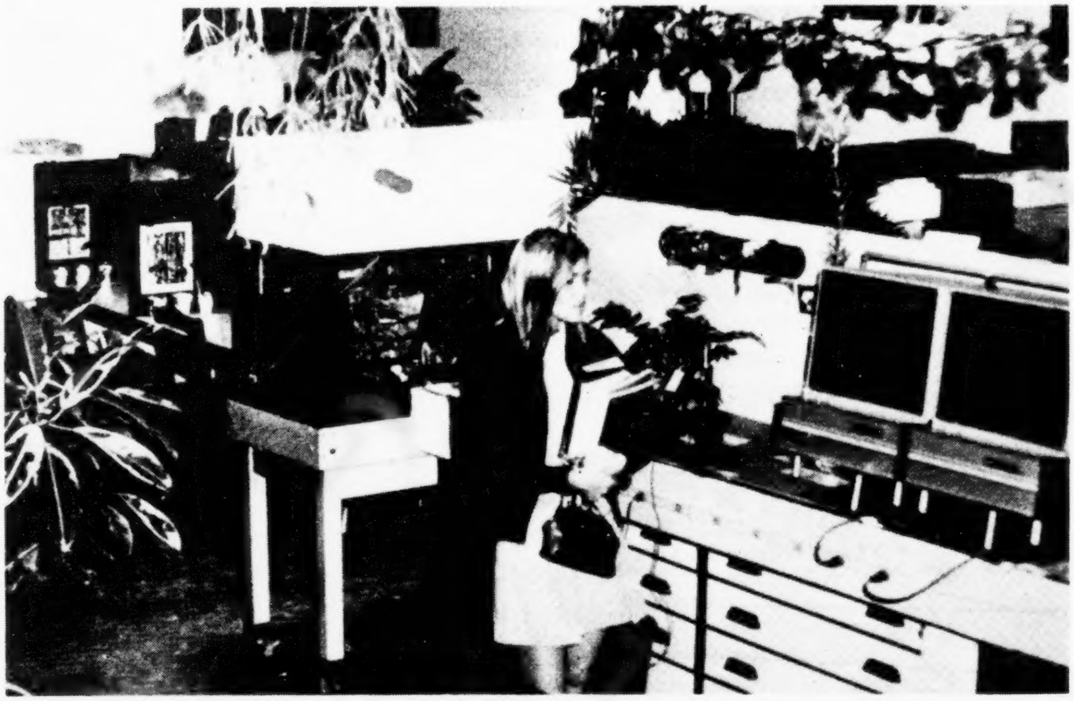


Fig. 1. Common communication media: 1. Tangible items (specimens, microscopes, experimental equipment, etc.); 2. Printed materials (textbook, Study Guide, manuals, journal articles, etc.); 3. Projected visuals (2x2 slides, movies, video tape) and 4. Audio input (in person, on tape or both).

2. Program of learning activities:

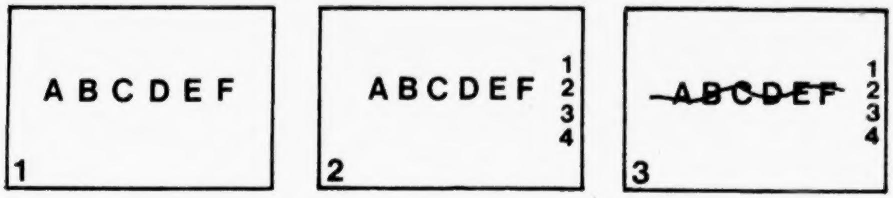


Fig. 2. Learning activities: 1. Sequential arrangement; 2. Objectives required; 3. Mechanism for involving the student with the assembled materials.

3. Rudolph's recommendation for a good learning situation: *Student on one end of the log and Hopkins (good teacher) on the other.*

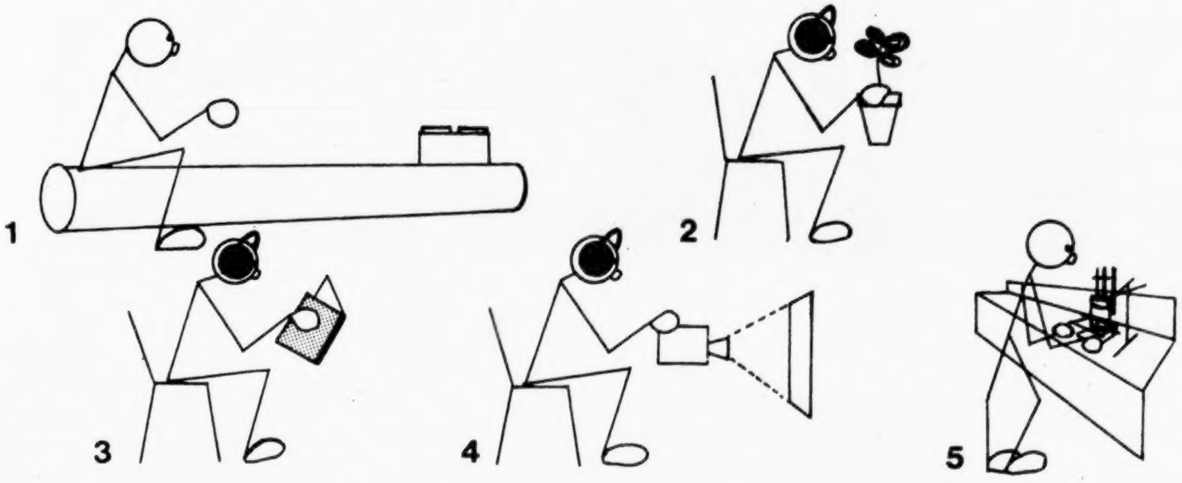


Fig. 3. Audio-tutorial is a simulated Hopkins arrangement. 1. Student, log and tutor (once removed). 2. Log - a tangible item. 3. Log - a printed item. 4. Log - a projected image. 5. Log - an experiment.

Exercise 1. Study slides labelled 1 and 2 and write a description of the activity that you believe to be represented in each slide. See Appendix II if slides are not available.

(1) Slide 1:

(2) Slide 2:

Exercise 2. Read the following excerpt:

> *If one uses the educational model proposed by Rudolph of a "student on one end of a log and Hopkins on the other" the role of technological devices becomes more clear and less foreboding to many of us. The purpose of technology in this context is to "capture" to the greatest degree possible the events or activity between the "good teacher" and student in a one/one relationship, so that the product can be duplicated to accommodate many students in a close approximation of the original situation. With today's audio and visual devices it is possible to involve the student with nearly every exposure to the subject conceivable. The programme can contain tangible, printed, audio and visual materials in any combination in which the "good" teacher wishes to use them. The only limitation is the capacity of the teacher and student to relate to the simulated situation.*
>
> *In 1961 at Purdue University a programme was begun which has been called the Audio-Tutorial system. The basic philosophy of this system is very simple. A "good" teacher is asked to assemble the items he would use to teach one student and, while sitting among these items, to record on audio tape the conversation he would have with one student as he tutored that student through a sequence of learning activities. The product - the tape, tangible items, visuals and printed materials can be duplicated as many times as necessary to accommodate any number of students. Obviously, the programme produced in this way will be limited by the cleverness of the teacher but the corollary is also true-a clever instructor can intimately involve the student in important and useful learning activities. The student now has access to the clever instructor in more ways than through the written word. Subtle communication through connotations by inflections in the voice are provided by the audio tape and the tangible, visual and printed materials assembled can exhibit the full skill of a great teacher to involve a student in a sequence of learning activities or a "symphony of learning".*
>
> -S.N. Postlethwait, 1972

B. The Beginning of Minicourses and Mastery at Purdue University, 1969 (Robert Hurst, Zoology, and Audio-Tutorial)

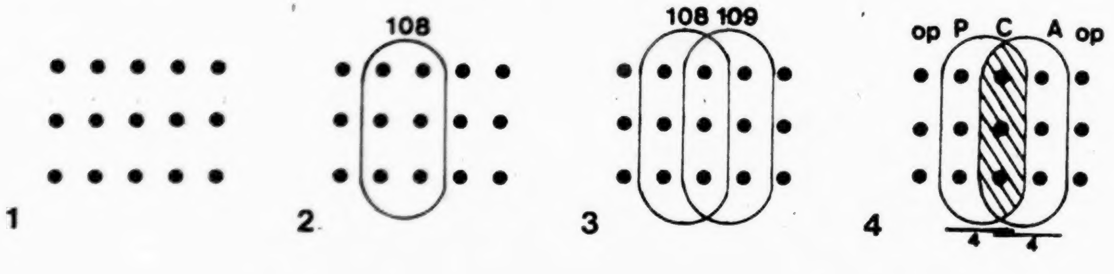


Fig. 4. Symbolic representations of a pool of minicourses illustrating various ways of classification. 1 . General pool. 2. Botany (Bio. 108). 3. Botany (Bio. 108) and Zoology (Bio. 109). 4. Optional (Op), Plant (P), Animal (A), Common (C).

C. Development at Macquarie University, N.S.W. Australia (1966).

1. Off-campus and on-campus students

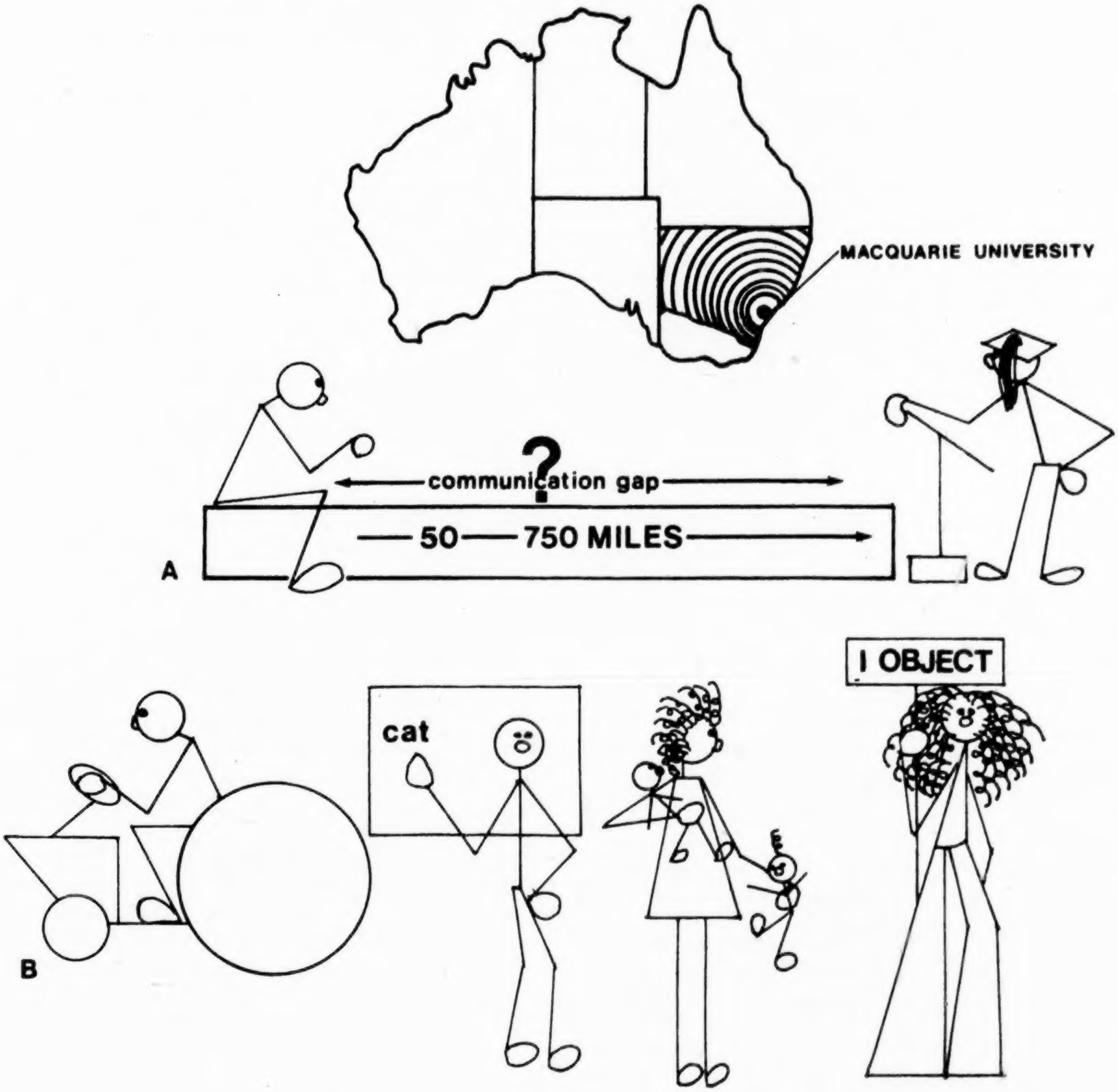

MACQUARIE UNIVERSITY
?
communication gap
50—750 MILES
A
cat
I OBJECT
B

Fig. 5. A. Communication problem. B. Diversity of student.

2. The problem of equivalence.

   But the usefulness of these programs has been artificially limited by their relegation to second-class status within higher education - Newman Report, p. 68.

3. The problem of teaching biology as an investigating activity. (See Appendix III)

II. THE NATURE OF A MINICOURSE

Exercise 3.

(1) Compare and contrast minicourses with conventional courses. Study the characteristics of each as outlined below. (This list was prepared by James Russell)

Conventional Course	*Minicourse*
LEARNING EXPERIENCES	
Conventional courses are usually characterized by lectures, reading the text, group discussions, and relatively isolated laboratory experiences. The learning experiences are oriented toward teacher performance and group instruction, with emphasis on teaching.	*Minicourses provide for a combination of learning experiences providing an integrated sequence so that each learning activity can enhance and complement the others. The learning experiences are oriented toward student performance and individual instruction with emphasis on learning.*
ROLE OF TEACHER	
The role of the teacher is one of disseminator of information.	*The role of the teacher is one of diagnostician, prescriber, motivator, and resource person.*
OBJECTIVES	
Objectives are not usually stated specifically in terms of student performance. They must be inferred from the content of the subject matter and tests.	*Objectives are stated in terms of student performance and presented to the student usually before the instruction begins.*
SELECTION	
Materials (texts, etc.) are selected first, tests are designed to sample this material, but desired student performance with respect to the materials is not always clearly defined in advance.	*Objectives are stated first, test items are designed to measure mastery of these objectives, then instructional materials are selected to assist the student in mastering the objectives.*
RATE	
Students are forced to go through the course "in a lock-step manner" (all going at the same rate). They all begin at the same time and are expected to finish simultaneously.	*Each student can proceed at his own rate. He is free to skip any portion of the minicourse as long as he can demonstrate mastery of the objectives. He is also free to repeat any portion of the minicourse as often as necessary.*

STRATEGIES & MEDIA

Teachers tend to use one or two strategies such as lecture and written assignments, regardless of the many different types of learning in the course (psychomotor manipulations, Cognitive skills and attitudinal changes). Media are prepared and used on the basis of familiarity (texts, films, 2x2 slides, etc.) and are chosen by the teacher on the basis of his feeling comfortable with certain media (usually printed).	Different learning strategies are used for objectives representing different kinds of learning. A variety of instructional strategies are used to optimize learning on a given topic. Media are selected to complement the type of objective and type of learner. Their efficacy is determined through trial use by students. A large variety of media are incorporated into each minicourse.

INDIVIDUALIZATION

Conventional Courses are group-oriented. Students are usually provided with a limited number of instructional resources. Usually the teacher specifies exactly how the student should proceed - read 20 pages of the text and answer 10 questions, etc.	Minicourses are highly individualized. Each student can use any or all of the media and materials available. The selection of the most appropriate approach is often left to the student - listen to a tape, read a text, look at diagrams, view a film, examine actual biological objects, or any combination thereof.

PARTICIPATION

The student's role is usually passive - reading the text or just listening to the teacher.	Minicourses provide for active student participation. The student learns by doing. The student is actively involved in manipulating the instructional materials.

INDIVIDUAL DIFFERENCES

Individual differences in achievement are expected. If a student wants enrichment materials, he usually must "dig" them out on his own. Tools and time for individual diagnosis and remedial help are normally lacking or insufficient. If a student is having difficulty, the teacher must work with him to help him keep up with the class or let him go and fend for himself.	A minicourse is considered a failure if a significant number of students fail to reach the criterion performance. If a student wants to study a particular topic in greater depth, he can secure supplementary materials and proceed without interrupting the progress of an entire class. Remedial help and extra time are also available for slow learners to reach mastery. If a student is having difficulty mastering a lesson, he can spend the additional time and get individual help from the teacher without delaying the entire class.

TIME

Time spent on a topic is usually constant for all learners resulting in no time variance, thus achievement scores correlate highly with I.Q.	The students spend as much time as necessary to master the topic. Time required for mastery is usually distributed normally and tends to correlate highly with I.Q.

FREEDOM

Traditionally, 45 minutes or an hour each day are scheduled at a fixed time for instruction. Students attend lectures and laboratories when they are in progress (e.g., from 8:00 to 8:50 on Monday, Wednesday, and Friday).	Instruction can be at the student's convenience and at the time of day when the student learns "best". Minicourses provide greater freedom for students to adjust study time and subject matter content to individual needs and peculiarities of interest.

REINFORCEMENT

In traditional courses student performance is reinforced or corrected only after major examinations. There may be considerable delay between the time the exam is taken and the time it is graded and returned to him.	The small unit of material in the minicourse permits immediate reinforcement and correction of student performance.

TESTING

Tests usually sample the content which has been "covered". Without clearly defined objectives, the student often does not know how to prepare (study) for the test. The student attends lectures, then takes an examination to determine his grade for the course. Tests are rarely used for feedback or diagnosis of student performance.	Learners are given the objectives and told how attainment of them will be evaluated. Tests are designed to measure mastery of objectives. The student receives credit when he can demonstrate mastery even if he has not gone through the minicourse. Test items (questions) are used for assessing prerequisite skills, for diagnosing difficulties, and for confirming mastery.

REFERENCE

Norm-referenced tests are used where success is dependent upon the performance of others in the class.	Criterion-referenced tests are used where success of the student is independent of the performance of others taking the minicourse.

MASTERY

Most learners know a little about each topic covered. It is not expected that all students can achieve mastery.	*Slow learners master some of the objectives, but may not have time in an arbitrary period for other objectives. Given time, even slow learners can master most, if not all, of the objectives.*

PORTABILITY

Conventional courses are usually based upon the teacher's lectures and are portable only by moving the teacher to a new location (sometimes accomplished via videotape). The lecture is usually lost forever once the class period ends. If a student misses part of a conventional course, he must talk with the teacher, review a fellow student's notes, or miss the instruction entirely.	*Minicourses can be portable and easily available at a variety of locations - in the field, at home, or in a hospital. They can be easily exchanged and disseminated to other schools. Since the minicourses are in individual packages, make-up lessons and review sessions can be accommodated with a minimum of effort. All students are exposed to the same instruction, regardless of the hour of the day or the day of the week.*

REVISIONS

Revisions often reflect preferences of the teacher for content topics to be covered. Many times revisions necessitate a complete rewriting of the text or study guide and a major revision of all study material.	*Revisions are based on student performance. If students are not mastering the material, it is revised. Subject matter which is constantly changing can be updated with a minimum of cost and effort.*

FLEXIBILITY

Conventional courses are structured around a semester or year-long study guide or textbook and tend to be inflexible.	*Minicourses can be structured into a greater variety of patterns consistent with different approaches or themes.*

COURSE SUCCESS

Lacking the features of systematic design and specific objectives, the teacher's judgment is the only provision for judging success of the course.	*Having a design goal and an evaluation plan, the minicourse developer is able to correct faulty instructional materials and know when he has succeeded in developing a successful minicourse.*

10

STUDENT FAILURE

Failure is usually not detected until the end of an examination period (six weeks or even a semester). Students often try to build hierarchical skills upon an inadequate foundation. Often students must repeat an entire semester or course.	*Inadequate achievement can be identified at each critical step in the student's progress. Consequently, the subject matter is mastered before the student proceeds to subsequent studies. Failure can be pinpointed specifically to both subject matter and instructional material, and subsequently remedied with a minimum of time and effort. The student has to repeat just that minicourse which was failed, not an entire course.*

(2) Write a definition of a minicourse in your own words, including characteristics of:

a. size
b. objectives
c. instructional strategies
d. at least two other points which you feel are important features of minicourses.

Note: Compare your definition with the one given in the Glossary.

III. SOME WAYS IN WHICH MINICOURSES PROVIDE FLEXIBILITY AND INDIVIDUALIZATION

Exercise 4. Study the illustrations below and then make a list of 5 or more ways in which minicourses can provide flexibility and individualization.

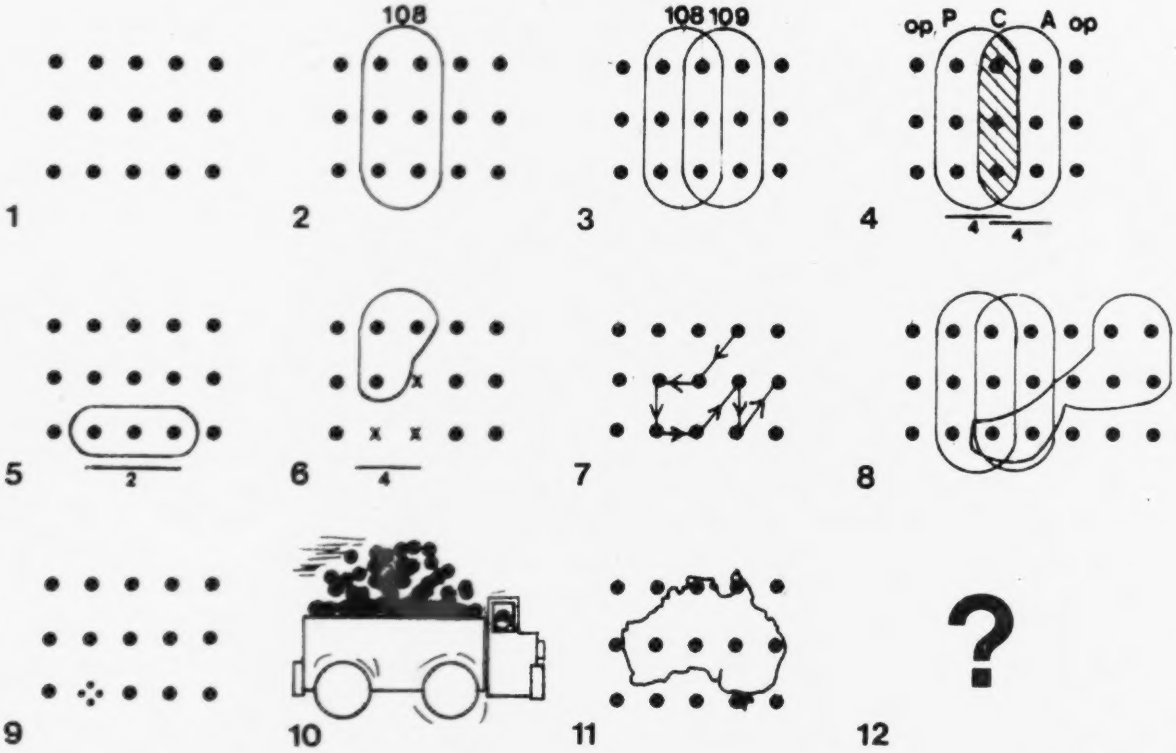

108
108 109
op P C A op
1
2
3
4
4 4
5
2
6
4
7
8
9
10
11
12
?

Fig. 6. Symbolic representation of some of the various ways minicourses can be used.

Your list:

(1) ______________________________

(2) ______________________________

(3) ______________________________

(4) ______________________________

(5) ______________________________

(6) ______________________________

(7) ______________________________

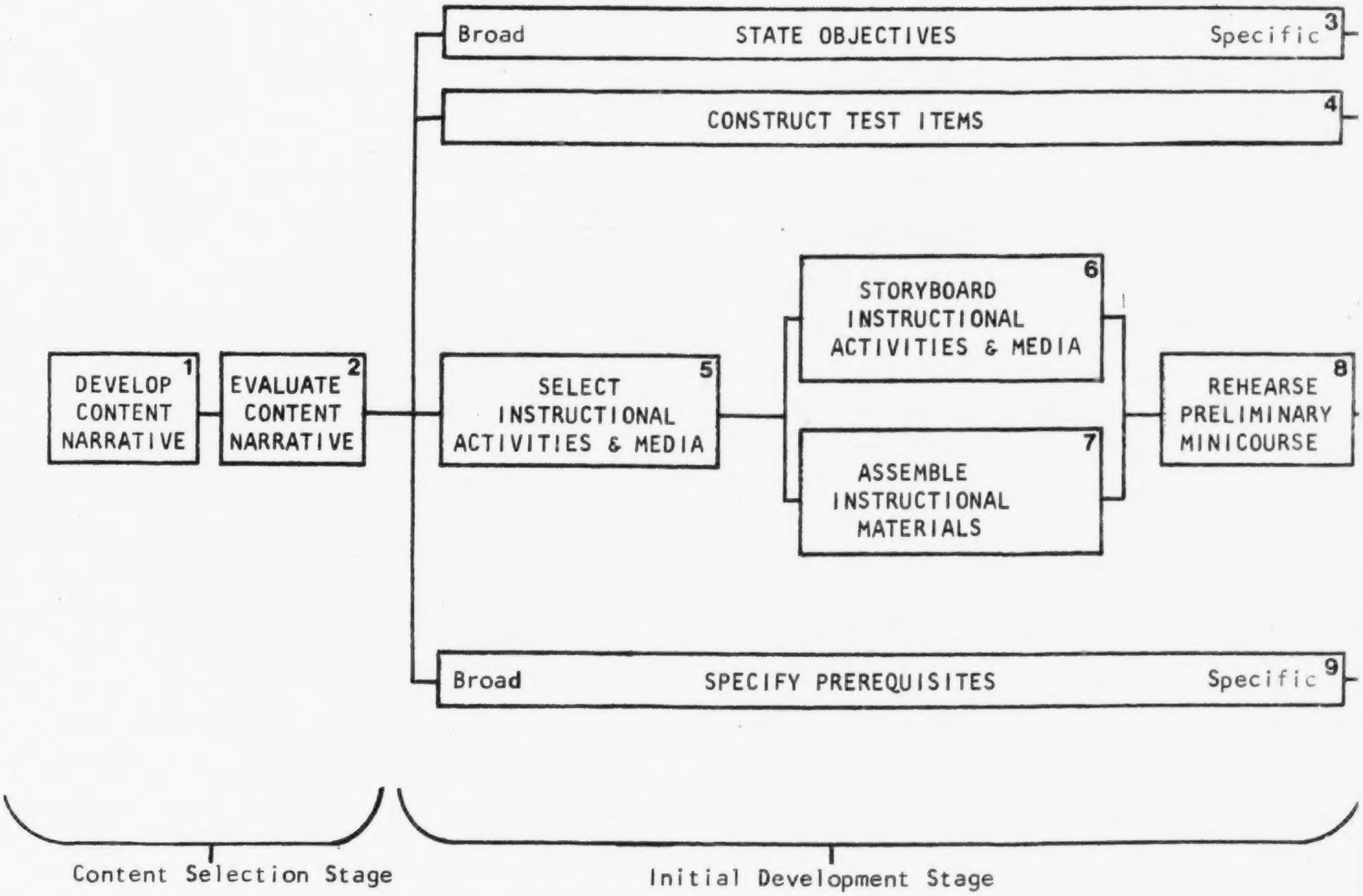
(8) ______________________________

IV. PREPARATION OF MINICOURSE MATERIALS USING THE AUDIO-TUTORIAL INSTRUCTIONAL STRATEGY

Exercise 5. (Optional). Review the audio-tutorial instructional strategy by viewing a portion of the film entitled *The Audio-Tutorial System.*

A. Guidelines for the development of minicourse materials used in the Minicourse Development Project at Purdue University.

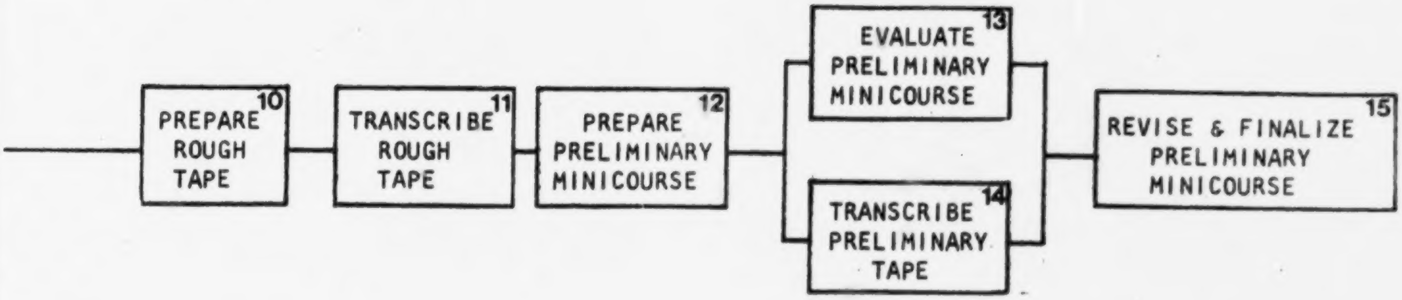
PHASE I


Broad
STATE OBJECTIVES
Specific
3
CONSTRUCT TEST ITEMS
4
STORYBOARD INSTRUCTIONAL ACTIVITIES & MEDIA
6
1
DEVELOP CONTENT NARRATIVE
2
EVALUATE CONTENT NARRATIVE
5
SELECT INSTRUCTIONAL ACTIVITIES & MEDIA
8
REHEARSE PRELIMINARY MINICOURSE
ASSEMBLE INSTRUCTIONAL MATERIALS
7
Broad
SPECIFY PREREQUISITES
Specific
9
Content Selection Stage
Initial Development Stage

Overview

MINICOURSE DEVELOPMENT SEQUENCE

Phase	I	II	III	IV
Operation	Preliminary Development	Pilot Testing	Field Testing	Publication
Product	Preliminary Version	Trial Version	Test Version	Final Version


PREPARE ROUGH TAPE
10
TRANSCRIBE ROUGH TAPE
11
PREPARE PRELIMINARY MINICOURSE
12
EVALUATE PRELIMINARY MINICOURSE
13
TRANSCRIBE PRELIMINARY TAPE
14
REVISE & FINALIZE PRELIMINARY MINICOURSE
15

Final Development Stage

MINICOURSE COMPONENTS:

Objectives
Test Items
Prerequisites
Abstract
Audio Tape
Tangibles
Visuals
Study Guide
Instructor's Manual

B. Photographic sequence of certain developmental steps.

1

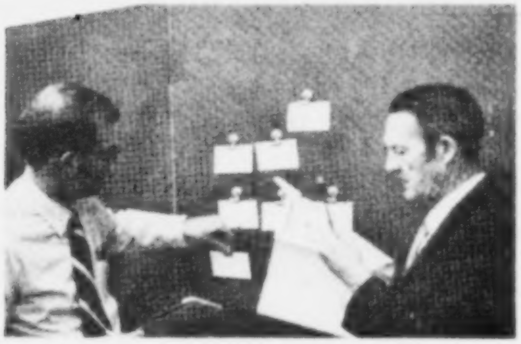
2

3

4

5

6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8

V. SUMMARY

A. One of the most important advantages of minicourses is the opportunity to develop, evaluate, and use a variety of instructional strategies to optimize instruction for students on a given topic. The approach can be carefully and deliberately sequenced, tried out with students, and revised until the maximum achievement is demonstrated by the most students. Careful evaluation makes it possible to measure and predict the effectiveness of each minicourse.

B. Minicourses utilize a wide variety of activities:

1. conducting experiments
2. reading textbooks and articles
3. examining diagrams and photographs
4. viewing films and colored slides
5. handling actual biological objects and models
6. studying demonstration materials
7. listening to audio tapes.

C. All sensory inputs can *and should be available* to the students in meeting the objectives of the minicourse. Each student can use any or all of the media and materials available. The selection of the most appropriate approach is often left to the student.

D. Minicourses are highly individualized. Yet, they can provide uniform instruction for a large number of students on an individual basis. The approach allows each student to study at a pace most effective and a time most convenient for him. He can pace his study according to his own ability to assimilate the information and master the objectives. Exposure to difficult subject matter can be repeated as often as necessary. Thus, all students can master the material; the slower ones are not forced to move on prematurely to new material.

E. In addition to student freedom, minicourses provide flexibility for both the student and the teacher. The small units of subject matter can be arranged or sequenced in a variety of formats. One minicourse might meet part of the requirements for several regular courses. The student might have the option of completing any 10 of a total of 15 or 20 minicourses to meet the requirements of a "total course." The student might also be free to select the order in which he studies some of the minicourses.

F. Minicourses can provide a maximum of student freedom for independent study. Minicourses also place the responsibility for learning squarely on the shoulders of the student. The emphasis is on the student's learning activities rather than on the teacher's teaching activities. A disadvantage of minicourses can be a lack of interest on the part of the student. Since the teacher is not always present and watching over his shoulder, the student may not be motivated or forced, in some cases, to pursue the learning activity. The content and style of the minicourse and the behavior of the teacher must create an environment in which the learner is inspired to become involved in the process of learning.

G. One of the characteristics of a minicourse is active student participation. The student learns by doing. Minicourses provide active involvement; they replace passive reading or listening with active involvement. The student handles learning materials, manipulates equipment, and responds frequently to pertinent questions.

H. Since minicourses are in an individualized self-instructional format, make-up lessons and review sessions are accomplished with a minimum of effort. All students can be exposed to the same material, regardless of the hour of the day or the day of the week.

I. Some critics feel that minicourses are void of human interaction. This criticism is true if the teacher uses minicourses as an excuse to spend classtime in the teacher's lounge or his office. Rather, the teacher should be available to answer students' questions and provide encouragement when needed. Once the minicourses are available, the teacher is freed from the routine and repetitive activities of teaching the same material again and again. He is then available to devote more time to the really important activities of teaching - inspiration, motivation, orientation, and personal contact. The teacher serves as a diagnostician, prescriber, and resource person - providing that information which he can present better than any other source. In minicourses teacher guidance is important since the student has greater responsibility for his own education than he has had in the past; *the teacher's role thus becomes more humanistic and less mechanical than before!*

J. Minicourses can be designed to provide student-to-student interaction. It is very difficult, if not impossible, for a student to learn interpersonal skills, such as salesmanship, counseling techniques, teacher competencies, etc., without having an opportunity to practice with another person. For a minicourse on salesmanship, the students might study in pairs - with one as the salesman and the other the client. Students should also be encouraged to work together on complex learning activities. They can discuss difficult subject matter areas and quiz each other on the topic. Many students find it helpful and enjoyable to tutor each other and assist one another in developing mastery of minicourses.

K. The authors strongly believe that minicourses *are* the style of the future. They need not be limited to formal education since their "packageable" nature makes them usable in continuing education and correspondence study. With increased leisure time, people are forming study clubs - informal groups for pursuing hobbies and interests. Minicourses offer a vehicle for involving all these "students" in active, meaningful learning. With a little ingenuity and creative application, they can provide equal opportunity education for all. The utilization of minicourses is limited only by the imagination!

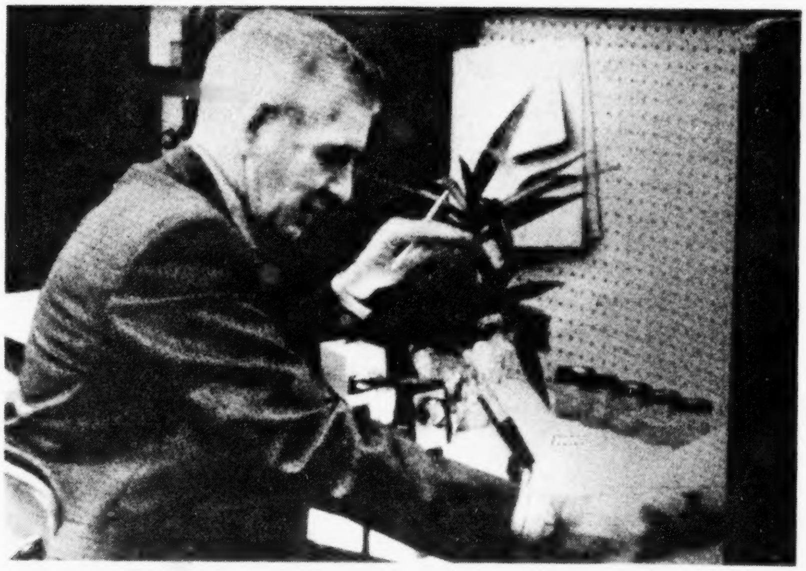
APPENDIX I

Both the Carnegie and Newman reports urge the need for reforms and both offer a number of suggestions including:

> *An educational format other than the classroom lecture reading format that now prevails.*
>
> *A different concept of what constitutes a campus.*
>
> *We believe it is time for a different approach to making higher education more available and more stimulating for those people unable to attend a college fulltime.*
>
> *We believe there are literally millions who can benefit from new approaches to education.*
>
> -Newman Report

> *To make educational opportunities more available to more people including women, employed persons, older people and persons from lower income levels.*
>
> *That opportunities be created for persons to re-enter higher education throughout their active career in regular daytime classes, night time classes, summer courses and special short term programs with degrees and certificates available as appropriate.*
>
> *That alternative avenues by which students can earn degrees or complete a major portion of their work for a degree be expanded to increase accessibility of higher education for those to whom it is now unavailable because of work schedules, geographic location, or responsibilities in the home.*
>
> -Carnegie Report

APPENDIX II



SLIDE 1

SLIDE 2

APPENDIX III

Items in Kit for Seed Germination and Plant Growth

Plastic tray with holes in base to allow drainage, to be used for growing larger number of seeds.
Blotting paper to line tray and provide a moist surface for seeds.
Plastic bag to cover tray loosely. This retains moisture in the early stages of germination but should be removed after three days or so.
Packets of seeds.
Disposable Petri dishes in which to grow seeds or isolated plant organs and tissues.
Filter paper circles on which to support plants and tissues.
Glass rods to support filter paper at surface of solution in Petri dishes.
Plant growth substance. (2, 4^{-D}, gibberellic acid).
Disposable pipettes for diluting growth substance solution.
Masking tape to use in making light-tight box in which to grow plants.

Supplementary items supplied for experiment: Breakdown of starch by germinating seeds.
Roll of 'Testape' (Eli Lilley) to determine glucose concentration in solution.
Small specimen tubes (1 to 2 dozen).

List of Some Experiments and Topics Utilizing the Kit for Seed Germination and Plant Growth issued to External Students

Plant Structure

Some difference between spores and seeds.
Structure of angiosperm seeds.
Seed dormancy and requirements for germination.
Anatomy of monocotyledon and dicotyledon seedlings.
Structure of meristematic and vacuolate cells.

Water Relations of Cells and Tissues

Imbibition by seeds.
Osmosis.

Metabolism of Germinating Seeds

Respiration, starch breakdown and sugar production.
Production of amylase by germinating seeds.
Effect of temperature on amylase synthesis.
Action of gibberellin on breakdown of starch via induction of amylase synthesis.

Growth of the Seedling

Mitosis in root squashes; action of metabolic inhibitors.
Role of cell division and cell expansion in growth; gamma irradiated and normal seedlings.
Cell differentiation.
The locus of plant growth - root and shoot growth.
Tropism - geotropism and phototropism.
Growth analysis of young plants - relative growth rate and net assimilation rate.
Effects of inorganic nutrients on plant growth.
Seedling development in light and dark.

Plant Growth Substances
Production of auxin by apices - apical dominance.
Effect of auxins on shoot elongation using coleoptile sections;
    time course of expansion; auxin concentration; use of inhibitors.
Effect of auxins on root growth using cucumber and cotton.
Auxin bioassay.
Sequential response of pea stems to auxin and gibberellin.
Morphogenetic effects of auxins.
Effect of gibberellin and CCC on the growth of dwarf beans.
Control of flowering.
Control of cell division by an interaction between auxin and
    kinetin.

GLOSSARY

CONTENT NARRATIVE: The subject matter of the minicourse. This may be derived from a variety of sources, such as subject matter specialist, textbook chapter, research article, or another minicourse.

CRITERION-REFERENCED EVALUATION: Judgement of a student's performance in relation to a predetermined standard (or criteria) instead of in comparison with the performance of his peers as in norm-referenced evaluation.

FIELD TESTING: The tryout of instructional materials under actual classroom conditions. The purpose is either to improve the effectiveness of the materials or to verify their effectiveness under given conditions.

MINICOURSE: A small course over a limited amount of subject matter. The content relates primarily to one topic and commonly would represent less than one credit hour of conventional course work. The study might involve a student for a length of time from as little as fifteen minutes to as much as two or more weeks. The instructional strategy should be appropriate to the nature of the subject matter. Self-instructional programs such as audio-tutorial programs are most commonly used; however, conventional strategies (i.e., lecture, laboratory) may be more appropriate for certain subjects. Minicourse materials are typically designed for use by one or two students but can be used by a larger group. Minicourses can be used individually or combined in a variety of sequences to total the equivalent of a conventional course. Objectives are clearly stated and achievement is assessed at the completion of each minicourse.

OBJECTIVE: A statement of expected student performance which includes the conditions under which the student will perform and a statement of acceptable performance. The objectives can be used by the instructor in his selection of minicourses for his course.

PREREQUISITE: A statement that specifies exactly what the student is assumed to "know" or is able to do before he begins the minicourse.

STORYBOARDING: The technique used to sequence instructional materials. The components are described on individual cards which can be arranged in a variety of combinations until the optimal sequence is determined. Individual items can thus be easily added or deleted.

TANGIBLES: Objects which provide direct experience with the subject matter being studied. Whenever possible, the real object is included.

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May 1972

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MINICOURSES - WHAT ARE THEY?

Instructor's Manual

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Preliminary Version

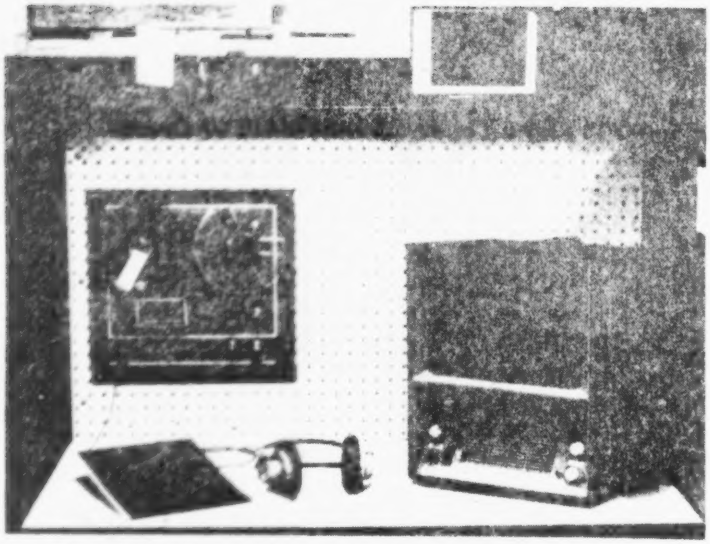

Fig. 1. The booth equipped for this minicourse.

INSTRUCTIONAL CONSIDERATIONS

This minicourse may be used by students in educational methods courses and minicourse development workshops. In addition, it may serve as an introduction to the minicourse concept for interested members of the general public.

BACKGROUND INFORMATION TO AID IMPLEMENTATION

All exercise questions are answered fully on the tape or in the Study Guide.

EQUIPMENT AND MATERIALS FOR BOOTH

Audio-Visual Equipment

Tape recorder
Audio tape
Film projector
Film, "Audio-Tutorial System". Available on a rental basis by writing Purdue Film Library, Audio Visual Center, Purdue University, Indiana 47907. The film is available in 16 mm. 8 mm is also available for use with Fairchild - Mark IV projector.
2x2 slide projector
2 slides (35 mm) depicting instructor and student in a booth setup. Available from the Minicourse Development Project, Purdue University.

Nonexpendable Materials and Supplies

None

Expendable Materials and Supplies

Study Guide

INSTRUCTOR'S REFERENCES

See references in the Study Guide. The following is recommended as a source of background information on the nature of minicourses and the Audio-Tutorial System:

Postlethwait, S.N., H. Murray and J. Novak. 1972. The audio-tutorial system -- an integrated experience approach to learning (Revised edition). Burgess Publishing Company, Minneapolis.

SUGGESTED TEST ITEMS AND ANSWERS

Objective 1. Write a paragraph of no less than 100 words and no more than 150 words discussing the history of the minicourse concept including the three main historical events emphasized in this minicourse.

1. Write a paragraph of no less than 100 words and no more than 150 words discussing the history of the minicourse concept including the three main historical events emphasized in this minicourse.

An. The three main historical events leading to the development of minicourses were: 1. The development of the Audio-Tutorial System, 1961; 2. The first use of minicourses at Purdue University involving Robert Hurst, Zoology (Bio. 109) and

Botany (Bio. 108), 1969; 3. A parallel development in Australia initiated by Frank Mercer, 1968.

The audio-tutorial system is based on Rudolph's definition of a good learning situation, "Hopkins on one end of a log and a student on the other." A good teacher is asked to talk into a tape recorder tutoring the student through a sequence of learning events using: 1. tangible items, 2. printed material, 3. projected visuals. The product (tape and "log") can be reproduced as necessary to accommodate large numbers of students.

The Bio. 108, 109 event involved a division of the content of the two courses into approximately 30 units for each course. Minicourses were classified as Plants (P), Animal (A), Common (C) and Optional (Op). Students were asked to master the subject matter of each minicourse.

The Australian experience involved the shipment of "learning kits" to external students at their homes with on-campus experience only twice during the year. This remote control teaching system was very successful, and these packaged learning materials provided a model for the further development of units of instruction. The same techniques were found to be effective with on-campus students also.

Objective 2. Define the term minicourse.

1. Define the term minicourse.

An. MINICOURSE: A small course over a limited amount of subject matter. The content relates primarily to one topic and commonly would represent less than one credit hour of conventional course work. The study might involve a student for a length of time from as little as fifteen minutes to as much as two or more weeks. The instructional strategy should be appropriate to the nature of the subject matter. Self-instructional programs such as audio-tutorial programs are most commonly used; however, conventional strategies (i.e., lecture, laboratory) may be more appropriate for certain subjects. Minicourse materials are typically designed for individual study but can be developed for use in group study. Minicourses can be used on a one time basis or combined in a variety of sequences to total the equivalent of a conventional course. Objectives are clearly stated and achievement is assessed at the completion of each minicourse.

Objective 3. List five ways minicourses provide more flexibility and individualization than possible under conventional instruction.

1. List five ways minicourses provide more flexibility and individualization than possible under conventional instruction.

An. 1. Eliminates redundancy in courses covering partially similar content.

2. A good vehicle for providing variable credit.

3. Makes individually prescribed instruction feasible.

4. Permits students enrolled in the same course to approach the content along different pathways.

5. A minicourse can be used in several different courses thus reducing the cost of development.

6. Alternate minicourses can be provided covering a given subject from different points of view and students can take the one most appropriate to their needs.

7. Many minicourse materials are portable thus freeing the student from the classroom as the primary location of study.

8. Minicourses make it feasible to develop exchange programs on a national and international basis.

Objective 4. Produce a minicourse following the guidelines included in this minicourse.

1. Produce a minicourse following the guidelines included in this minicourse.

An. Production of a minicourse according to the guidelines included in this minicourse.

MORE ACCOUNTABILITY IN HIGHER EDUCATION THROUGH BETTER MANAGEMENT PRACTICES

Dr. R. E. Lahti
President, William Rainey Harper College, Palatine, Illinois

In Sam Postlethwait's presentation this morning I believe the focus was more towards teaching faculty than academic administrators. I'm going to refocus a little bit and aim my comments more at educational administrators.

Since I arrived here last evening I have had several different individuals ask me to talk about various facets of our operation and some of the systems that we have going. I'm not here to give you an extended commercial and I feel somewhat self-conscious about talking too much specifically about our institution. I come as an educator to share with you many of the things we are doing which may be of interest to you. In no way do I mean to represent that we have all of the answers, but I think we have a good start. We have a tremendous group of people and that's the beginning of making good things happen.

One of the things we have that we think is producing some good results is a ten year long-range plan produced with involvement from the entire faculty and some 'blue ribbon' citizen committees in our community and which will ultimately be adopted by the Board for implementation by the faculty and administration. It's been a most successful operation and I can flatly say that I disagree with any administrator or faculty member who says that faculty and administration cannot work together in looking at the total goals and the future of an organization. We have done it and faculty have made a great contribution in this process.

A second thing that has helped us tremendously managerially is the management by objectives system. The

LAHTI...cont'd

total institutional goals are stated and approved by the Board on a yearly basis. Each manager's goals evolve out of these institutional goals. He commits himself to the goals, is evaluated at the end of the year, and is awarded his pay raise based on a certain base salary raise plus a bonus, which this year is about 15% of administrative salaries. The teaching faculty and classified staff are also on a merit system. All of these systems have been designed by the people to whom they are applied and the Board has approved the systems for application.

Another activity which we think is giving us a great deal of pay-off is our developmental programs. We make a formal budget commitment for developmental programs for managers, faculty and classified people.

My view of the operation of an effective organization is that work and productivity can be fun if you have developed the right people-relationship. We are trying to build a creative environment to reinforce the creative efforts of all of our people by setting a certain number of dollars aside for Special Projects for Educational Development, SPED projects as we call them. Through a very short application process a faculty member can get funding for a project that he thinks will add to or enhance the student learning in our organization. The largest grant that we have made so far is $4,500. We set aside about $15,000 a year and this year for the first time we had requests for more than $15,000. The first two or three years the faculty didn't utilize the total amount of money that was set aside. It took two years to build up to where we are now.

We have an innovative travel fund for faculty. If faculty hear about a good idea and would like to go and investigate it and adopt or modify it with their peers, through a very simple application process, they can receive funds for travel.

Each faculty member in our organization has what we call a professional expense account, around $100 or $150 per year, for subscribing to special publications, professional journals, etc.

These are some of the things that people have asked me to sketch briefly for you. To discuss any one of them fully would be to utilize more than my share of time this afternoon. I would be happy to visit with some of you later to talk individually about any of these specific topics.

The thrust of my talk today is to give you my opinion of some of the hurdles and challenges higher education faces. Since I arrived on campus yesterday, I have been trying to determine whether Canadian community college problems are any different from those in the United States. A number of my Canadian friends and I, after comparing notes,have agreed there was very little difference, so I am assuming in my talk that many problems that we have in the United States are very similar to the problems that you are facing in Canada.

I think all of us believe that in the past couple of years the climate of support for higher education has changed radically and will probably continue toward skepticism. For the past couple of years I have made it my business to read carefully what the critics have been saying about higher education, and I think their comments can be placed in two categories: New priorities and the Confidence crisis. So I'd like to move through those two topics very quickly and share with you what might be called a consensus of the critics. Then after that I will suggest some of the things that I think will help higher education clear these hurdles.

First the priorities. I think that in the past few years in our countries there have been unexpected priorities that have loomed greater than any of us ever expected; Certainly pollution or environmental control, health services and welfare (and in our case) war and for all, the elimination of poverty. All of these topics are of such magnitude that they now share priorities with education. And as a result of this we are all realizing that there are limits to the resources of any great nation.

I was born in a somewhat similar environment to Sam Postlethwait, a rural village in South Dakota. Little did I think that when I looked up in the sky and saw the sun shine and white, fleecy clouds that one day there might be a limit to the amount of fresh air that would be available for me to breathe. I remember fishing in streams where you see the stream bed almost any place that you could walk. Little did I believe that one day we would have lakes and streams that would be so murky we couldn't see six inches into them. Little did I think that one day we would have to think seriously about population control; and of course, being born in the United States, a capitalistic nation, I didn't think that we would ever run out of financial resources. I think other nations still think that we won't, but our propaganda may be too good in this respect. But right now I think we are all aware that there is a limit to most all resources, and, of course, the one that is affecting us more than any today is the limits of financial resources available to support education. So in a nutshell, new priorities and the limits on resources because of these priorities are creating a great problem for us to cope within higher education. We are going to have to change our style.

Second, the confidence crisis. The critics and management consultants have really been having a "hey-day" for the past two or three years, and I've made it my business to try to get ahold of every possible article that was critical of higher education and try to summarize what was being said. I believe that if you systematically analyze what the critics are saying, ten or twelve different topics emerge.

First, there seems to be a consensus that higher education in the past few years has shown itself to be ungovernable. The internal governmental systems that are being applied are not efficient and don't provide the decision-making processes for the productivity that the public sector desires.

Secondly, higher education is castigated overall for not being efficient - I'll be more specific later. Higher education and its components do not have unified purposes; teaching faculty have one goal, administration another, the students another, and the custodians another. Some of this debate has come to the attention of the public and they are saying, "My goodness, you folks don't even agree among yourselves about what you should be doing or how you should be doing it".

Another aspect of the confidence crisis in my mind is that the older generation is revolting against the life styles of the younger generation and since we harbor a good number of young people in our institutions, we are naturally villains for harboring the new life styles that don't seem to fit some of the styles of the older generation.

We are also being accused of failure to design change by establishing priorities and reallocation of funds - that the only change that is taking place in education is what is being forced to take place because of growth.

We are being accused of not facing issues until they can't be avoided. An example is teacher loads.

We are being accused of not being in control of our own financial destiny, that we are not doing enough to control costs currently and have no visible plan for how we'll control the costs in the future.

We're also being accused of making decisions based on historical cost information and inputs rather than making decisions based on outcome, results, or benefits.

As my colleague introduced me, he very well stated that the general public is accusing educational management of possessing insufficient management skills and for not applying management systems to the higher education sector. They accuse us of having non-existent or very poor long-range planning processes.

We're being accused of using our facilities inefficiently. I believe all of us would agree that if you were to walk into a majority of institutions at 3 o'clock in the afternoon, you could probably throw a bowling ball down the hallway and not hit a faculty member or a student. Some legislators have proved this.

We are accused of ineffective budgeting practices. Earl Cheit, one of our own kind - Professor at Berkley - wrote the book, The New Depression In Higher Education. What he found is that the more money that is available to an institution, the higher cost per student. He says that was the most common budgeting practice that he could observe. The public is saying there is only one way to stop price escalation in education and that is to cut off the money source. That's what has happened. Others are saying that educators have learned to add and multiply but have never learned to subtract or divide. Another author calls our budgeting practices "creeping incrementalism" - that if we go up 5% in students, we go up 5% in the budget.

We're being accused of being very inefficient at decision-making. As I tell my colleagues, it is no longer a matter of faculty involvement - any good manager should have known that he should utilize the total resources of his organization - the real question in the utilization of these resources is to make timely decisions before the law makers do it for us.

We're being accused of lack of agreement about priorities in our organization. Placid leadership, lack of clearly defined goals, insufficient evaluation of the quality of output - the list goes on,although I believe the items that I've mentioned are those that are most frequently discussed in critic's articles.

I'd now like to take a little side-trip as it relates specifically to community college faculties and administrators. We verbalize that we are the new innovative, creative institutions, both in Canada and the United States, and that we're going to break the lock-step and come up with the new systems.

One of the great challenges I think we have with the total faculty is to be sure that when we get into an experimental mood that experimental design be given careful consideration. We have to be careful that we don't make guinea pigs out of youngsters in testing experimental or innovative practices. I believe that in our country, and perhaps in Canada, one of the great weaknesses of a community college faculty is their lack of background in methods of research, experimental design, sampling, evaluation techniques, etc. In no way do I mean this to be critical, I just think it's a deficiency in training programs.

My concern is when we reach the political and legislative level in competition with our four-year college brothers, we had better be there with good hard data. In many states in our country the fight is already on because the four-year college enrollments are beginning to level off. In the State of Illinois I believe they dropped about 1% last year and the community colleges went up 10%. For the first time, the community colleges got a fair share of the new money. Then people began to ask questions about what they did with it and how they utilized it.

What valid results can they show to prove they are making good use of this money? I suggest that any president who has any reasonably sized institution should have personnel assigned to the research and evaluation function.

The research office should be utilized as a resource by all teaching faculty. Eventually, as the institution grows and fails to keep up with all the demands, in-service or development programs must be established to upgrade people individually.

Let me now turn to some of the things that I think need to be done that may assist us out of the confidence crisis, help us get over the hurdles that are being placed before us and help us get more from our resources in order that we may continue to compete with all other priorities.

First of all, it seems to me that most of the successful or effective organizations have built-in development programs for their people. I believe higher education in general has been somewhat remiss on this score. It seems to me that we may have made the assumption that once you get a BA, MA or PhD, you either know everything that there is to know, or you can pick it up on your own without any type of formal development program. I think that as rapidly as changes are taking place there needs to be a formal manager development program for the managers.

And there needs to be formal development programs for teaching faculty. I've had good debates on this topic. People say that the faculty have just got to change their teaching styles, their techniques, their methodologies, so I go to the Board, and I say, "Yes, I agree with that. But we will need some money". Just as it takes time and money to retool an engineer, it's going to take time to retool our teaching faculty who are products of a system that has used only lecture methodology. I don't think administrators should say to faculty that you must change your ways without providing resources, released time, and faculty development programs.

At the same time, I feel just as strongly that before leadership throws the stones, looks for excuses and blames the faculty, they want to be sure their own house is in order and that they understand very well the function of effective management in their organization, that a management team really does exist and that they are creating an environment which will allow for the most productive learning conditions for the students - an environment which will allow the faculty to practice the very best methodology on behalf of students.

All the way up and down the line, I think that organizations need to look at their people, and with all the changes taking place, reorganize and commit resources to helping these people change.

I would like to take you for a minute to some overlays (Figure I) which lists some of the management exercises which we think have significantly helped our educational managers.

I suspect that if I had an academic administrator here who had thought much about this problem, that he could come up with an overlay and lay out ten to fifteen topics that would be very applicable to all faculty in terms of faculty development. However, in the preceding case I am talking specifically about management development.

First is the role and definition of a manager. I happen to believe that most educational administrators have been acting like stewards for the past several decades and I think the pressure is being put upon us now to be more accountable and act more like a manager. I would say that an overly simplistic definition of a manager is one who gets things done through and with people. I emphasize the "with" and "through".

THE NEED FOR MANAGEMENT DEVELOPMENT IN EDUCATION

I. The role and definition of a manager

II. Delegation of authority

III. Effective management of time

IV. Coaching and development

V. Interviewing and selection of personnel

VI. The appraisal process

VII. Management systems

    PBBS
    PERT
    MBO
    OD

VIII. Effective decision making

IX. Conflict Resolution - problem solving

FIGURE 1

X. Organization vs Individuals (diverse motivational forces)

XI. The reinforcement of creative behavior for building creative organizations

XII. Research and evaluation techniques

Experimental Design, Methods of Research, Sampling, Effective Measurement Techniques, etc.

XIII. Effective wage and salary administration

XIV. Collective negotiations

XV. The long-range planning process

XVI. Effective budgeting procedures

FIGURE 1 ..cont'd

I think we really need to emphasize what a manager does in an educational organization and what his role is in the organization. I think that unless a student has a few courses in a school of industrial relations or a business management school that the role of a manager is discussed at all.

Second, the delegation of authority. Yes, these are very simplistic things, but look at an organization and see the appalling ways in which some managers practice these very simple administrative approaches. Without being critical, I say in most cases that they are running through trial and error. This is tremendously frustrating to faculty and should be. It is pretty frustrating to an administrator too, as he works through this trial and error process.

Effective utilization of time. I think education is being looked at carefully in this aspect - what would we do with the time we have allocated.

How about coaching and development? Across the United States, maybe not so much in Canada, we have always said that if a person doesn't perform we get rid of him - we take the punitive step. I think we should turn that all the way around if one is a good manager, and if someone isn't performing, one should ask, "What have I done to help this person"? If a manager makes a recommendation to fire a person in our organization, he had better have well in mind what things he has offered, what things he has tried to do to help the person before recommending the worst and simplistic step of solving his problem.

Interviewing and selection of people. How do we acquire division or department chairmen? Correct me if I'm wrong, but I say generally the way it happens is that we look at one of the top teachers in the division or department and the Dean or someone goes down and says, "Well, how would you like to be division or department chairman next year?" And the person says, "Well, that sounds interesting, tell me more about it." The Dean says, "We'll raise your salary", and "you'll have these additional privileges" and maybe offer several other explanations which may or may not be relevant to becoming a manager. Generally people are accepting these positions for all the wrong reasons - money, status, etc. They should be accepting the position because they want to, or enjoy being challenged by getting things done through and with people. I think too many people who are managers are in the position because of status, the desire to wield some power, and have an increased salary.

The appraisal process. What about the good English teacher who very innocently says, "Yes, I'll be division chairman next year", and so 60 days later this person finds himself in a chair with the same skills as his peers only now he is in charge of coordinating, managing or supervising 40 people. His skills aren't any different than the 39 other people he is in charge of. We haven't done a thing for him and then that next year he is expected to be an appraiser, a coach, an interviewer, a selector, a delegator, a manager and use his time well. We have done nothing to help this person adjust to his new role and then the jargon starts. PPBS, PERT, MBO, OD. He just shakes his head.

When you are an English teacher and you were in charge of your own classroom, you had a certain amount of independence and pride - you had that precious academic freedom and tenure. As soon as you accepted the job as division or department chairman which is a supervisory position, or in my terms, takes on many aspects of a managerial position, you then are going to be put in the role of being requested to have greater organization loyalty and a lesser loyalty for your own discipline. A lot of people don't find that out until they sit in the chair and so when the Dean comes down and says, "Well, you've got to go out and tell your peers that there aren't going to be any raises this year in your division", he says, "What the hell do you mean? I didn't take this job to do these kinds of nasty tasks". When he learns that he's going to have to go out and evaluate 30 of his peers and put a rating of 1, 2, 3 or A, B, C, however it might go, he says, "No, that wasn't part of the job". But now you see, he's become an organization man but still has his individual loyalty to his discipline. Some grave anxieties build up in people and we find that many of them, after experiencing this trial and error method, say, "I don't want any part of it - I want to go back to the classroom".

It's a very inefficient process and I think we could prevent some of it by management development.

And then, of course, additional pressures come to the new division chairman. Get out there and reinforce that creativity - get them to innovate and create an innovative climate in your division with the person still wondering "what's this all about?" How have we helped this person to recognize some of the marks of creative organization or how you go about generating an environment for creativity?

Effective wage and salary administration. You know if we were to look at most organizations, 80% of their budget is tied up in salaries for personnel, and yet very few higher education organizations have formal wage and salary administration programs which consider internal equity for positions, external equity and equal pay for an equivalent position.

Collective negotiations. It is a process, a very challenging process. Boards and administrators have been playing give-away for the last ten years. Nc _quid pro quo_, and that to me is ineffective management. Collective bargaining is a legitimate process, but it is a _bargaining_ process and that is if you give something, you get something back and it isn't a game of give-away. And here are the Boards and managers who have all the money, all the resources, and each year they play give-away, until you get to the point - where in some systems in the United States - the faculty have negotiated salaries so high that the organizational budget can't meet the budget and then they wonder why 20-50 people have to be released. You know that really doesn't make sense. At one end they give away resources and at the other end they cut the legs out from under their selected human resources or get rid of them. So I think the total negotiation process has to be brought into perspective from a management viewpoint as well as a teaching-faculty viewpoint. There has to be some balance in it, some better planning and better controls.

I wonder how many higher education organizations in Canada or the United States you could find which had a long-range plan which talked about the financial resources, the physical resources, the human resources, and any number of other elements which go into a good long-range plan. Most of them have beautiful long-range plans for physical resources, and they say, "Well, this is what we hope to build here some day." But there may be no relationship to where the money is going to come from or what the student/staff ratio is going to be, or what the teaching method is going to be, etc.

Lack of long-range planning is something that we are being criticized severely for. I have heard some of my colleagues in the past year say that they will do long-range planning when the legislators get to multiple-year funding. I say that is a pure cop-out and will not be saleable to legislators or citizens. I think long-range planning forces you to make assumptions. You must make those assumptions and evaluate or validate them as regularly as you need to in order to see that what you want to happen will happen. And I think that using the lack of multiple-year funding as an excuse for not having a long-range plan is pretty weak.

Effective budgeting procedures. I think any good system puts money decisions and budget decisions closest to the people who are affected by them, and I believe a lot of institutions have not followed that practice. Here's a good example. We have in our organization about a $400,000 data processing budget. Two years ago, we decided to decentralize those costs to all of the major budget centers. One day the vice-president of student affairs came in and said, "Now wait a minute. I'm being charged $180,000 for that computer time and look what I'm getting. I'm not sure I want that computer". But when you put out those costs to the division to the man in charge, he says "wait a minute - we really can't justify that kind of cost". So I think that if you get good people and good budgeting practices, they may effect economies for you.

There are other things that we could discuss in Management Development, but I would like now to move quickly to Management Development vs Organizational Development.

In my opinion, management development is an interim step. It is a necessary step for an organization but it is not the total answer. We must then move to what is now called organizational development. This is where the total team commits itself to a plan or an effort to change itself. (Figure 2). The leadership has to come from the top and the ultimate goal is to increase effectiveness and the health of the organization.

These are the kinds of things that I think demand OD efforts, organizational development (Figure 3). The need to change a managerial strategy arises, for instance, if there is a person who is practicing autocracy or dictatorial strategies as an organization grows. An OD effort may be necessary to change that.

MANAGEMENT DEVELOPMENT
VERSUS
ORGANIZATIONAL DEVELOPMENT

I. Definition of Organization Development

1. It is a planned change effort
2. It involves the total "system."
3. It is managed from the top.
4. It is designed to increase effectiveness and health of the organization.

FIGURE 2

III. Kinds of Organization Conditions that Call for OD Efforts

1. The need to change a managerial strategy.
2. The need to make the organization climate more consistent with both individual needs and the changing needs of the environment.
3. The need to change "cultural" norms.
4. The need to change structure and roles.
5. The need to improve intergroup collaboration.
6. The need to open up the communications system.
7. The need for better planning.
8. The need for coping with problems of merger.
9. Need for change in motivation of the work force.
10. Need for adaptation to a new environment.

Beckhard, Richard, Organizational Development: Strategies and Models, Addison-Wesley Publishing Company

FIGURE 3

The need to make the organizational climate more consistent with both individual needs and the changing needs of the environment is a legitimate effort.

The need to change cultural norms within an organization. What was considered a good mode of practice may now be considered obsolete.

. The need to change structure and roles. Perhaps an organization structure that worked well for 2,000, 3,000 or 4,000 is now ineffective at the 10,000 student level.

The need to improve inter-group collaboration, and so on down the list. These are some of the things, not original with me, that have been tested in private business and which I think have tremendous relevance to what is being asked of us nowadays in higher education.

Let me close by showing you two overlays, (Figure 4) of what several experts agree to be characteristic of an effective organization. Perhaps you would like to test your own college against these criteria.

First, you would be considered to be an effective organization if the total organization, the significant subparts, and individuals, managed their work against goals and planned for the achievement of these goals. I believe this whole conference centers around this.

Our old friend, John Gardner, simplifies what he considers to be an effective organization. I think if we'd take these five rules (Figure 5) and apply them consciously to our organizations we might end up much more effective than we are.

In summary, what the public is attempting to communicate is that they want greater accountability, and they

AN EFFECTIVE ORGANIZATION

AN EFFECTIVE ORGANIZATION IS ONE IN WHICH:

a) The total organization, the significant subparts, and individuals, manage their work against goals and plans for achievement of these goals.

b) Form follows function (the problem, or task, or project, determines how the human resources are organized).

c) Decisions are made by and near the sources of information regardless of where these sources are located on the organization chart.

d) The reward system is such that managers and supervisors are rewarded (and punished) comparably for:

    short-term profit or production performance,
    growth and development of their subordinates,
    creating a viable working group

e) Communication laterally and vertically is relatively undistorted. People are generally open and confronting. They share all the relevant facts including feelings.

FIGURE 4

f) There is a minimum amount of inappropriate win/lose activities between individuals and groups. Constant effort exists at all levels to treat conflict and conflict-situations as problems subject to problem-solving methods.

g) There is a high "conflict" (clash of ideas) about tasks and projects, and relatively little energy spent in clashing over interpersonal difficulties because they have been generally worked through.

h) The organization and its parts see themselves as interacting with each other and with a larger environment. The organization is an "open system."

i) There is a shared value, and management strategy to support it, of trying to help each person (or unit) in the organization maintain his (or its) integrity and uniqueness in an inter-dependent environment.

j) The organization and its members operate in an "action-research" way. General practice is to build in feedback mechanisms so that individuals and groups can learn from their own experience.

Beckhard, Richard, Organization Development: Strategies and Models, Addison-Wesley Publishing Company.

FIGURE 4 ...cont'd

JOHN GARDNER'S EFFECTIVE ORGANIZATION

An effective organization is one which is self-renewing.

THE FIRST RULE is that the organization must have an effective program for the recruitment and development of talent.

THE SECOND RULE for the organization capable of continuous renewal is that it must be a hospitable environment for the individual.

THE THIRD RULE is that the organization must have built-in provisions for self-criticism.

THE FOURTH RULE is that there must be fluidity in the internal structure.

THE FIFTH RULE is that the organization must have some means of combating the process by which men become prisoners of their procedures.

FIGURE 52

are offering us three options. One is more and better learning at the same cost; two, better or the same learning at less cost; and three, significantly greater learning at a greater cost. I believe the public will go for any one of these options, although in my opinion, number three is the one which we are going to have to consider most seriously in higher education. In no way are we going to be able to make the cost of education go backwards. About all we can hope to do is to slow the costs down and show significantly greater productivity for some additional resources.

ASSUMPTIONS UNDERLYING INDIVIDUALIZED INSTRUCTION

Dr. John E. Roueche
Professor of Junior College Education
The University of Texas at Austin

I want to share a story with you this morning (a true story, as all my stories are true), which has to do with instruction and teaching. It happened to me while I was an undergraduate in a small liberal arts college in North Carolina. I was a senior, after having made it through the first three years there, and thought I was doing pretty well until along about the end of November I was summoned to the Dean's office. Right away that tells you it was some time ago, you see, because Deans don't have that kind of power today. Today's Dean would send a courier to find out if the student and his attorney were willing to meet in some neutral spot to discuss whatever issue the Dean had in mind. But in my day, Deans had great power and they exercised it ruthlessly. So I made my way into the Dean's office and found there a friend of mine, a fellow by the name of Benny Creed. The Dean ushered Benny and myself into his office and told us to sit down. Benny and I sat down very quickly, and then the Dean looked us squarely in the eye and said, "You guys are shy". Well Benny and I knew immediately that he was not referring to our personalities because we had been to see him about personality matters before. He further defined shy as deficient and then went on to explain that both Benny and I had undertaken more hours for credit at our little college than we had accumulated quality points for. You know what quality points are, I imagine - you have to have at least a C average. We asked the Dean what the implications of this situation were, and he said, "They're pretty damned severe for you both. You've got to make at least one B next semester in order for you to graduate."

Well, that was a pretty severe implication because Benny and I had not seen a B in a couple of years. We decided that if we had to make a B, there were systematic ways to go about choosing a course, so we very carefully got a sheet of paper and outlined all the criteria we would use in selecting a course in which to obtain a B. Now I'm sure you have never done a thing like that. We put down everything that was important to make a B and then we got the college catalogue and decided to go through the course offerings very carefully and select those courses that most nearly met our criteria. The first course heading we found in the catalogue was Anthropology. We turned right on past Anthropology and the next course was Art. From Art we hit Biology, and from Biology we moved right into Chemistry and we hadn't looked at a course yet. These were just headings. From Chemistry we moved into English, and then into French, Geography and History, and Benny said, "My goodness, we're halfway through the catalogue". I said, "Don't despair, Benny, we'll find something yet", only to turn right into Mathematics, and from Mathematics into Physical Education, then to Physics, and we hadn't looked at a course yet when we came upon Religion. This was a little Lutheran school, remember?

Well, you know, there is something nice about religion - you just assume that people who are religious love one another and have good feelings for one another. So we decided to look carefully at the Religion courses. We came to one called "The New Testament". We looked it over and saw that Professor Rudisell was teaching that course - Professor Rudisell had taught that course every semester for 50 years. Well, we put a check beside Experienced Teacher Required - we didn't want anybody right out of graduate school. Secondly, Professor Rudisell who was 75 years old had only peripheral vision. He could only see out of the side of his eyes, and was very sensitive about this, so he never called the roll. Well this was on our list too, so we put a couple of checks by that. The thing that clinched the course for us was that Professor Rudisell had given the same final examination question every semester for 50 years. That exam question had been "Discuss the travels of the Apostle Paul". Benny and I signed up for "The New Testament".

Well, spring semester began. Some days we went to class, but I have to confess that most days we did not. Most of the bridge skills that I now have I developed in college - college contributed a certain confidence that I have even today. About a week before the end of the semester, Benny and I were in the student centre and we were playing a 4-heart contract. I had to make 2 finesses in order to make the contract and Benny said to me, "Who was Paul?". I went down 2 and I said "Benny, I don't know, but it behooves us at this point in time to find out".

Well, we asked some of the students from the course who Paul was. One of the students said that we ought to go to the library and get a Bible. We went to the Library and Benny (who, by the way, is a preacher today) told the librarian he was looking for a copy of the Bible and the author was James King. Well, the librarian looked for 20 minutes and couldn't find it. Finally she got us a copy of the Bible and admonished Benny that if he was going to be a preacher he should know that it was King James, not James King. Benny said that he hadn't had that course yet.

Well Benny and I made our way back to the dormitory and we began to read. We read all afternoon and late into the evening. We got through Genesis, Exodus and were deep into Deuteronomy, as I recall, and no mention of Paul - not a single footnote, no reference, nothing. Benny suggested that we use the index, but there is no index as you know.

We decided late that night to get some help. Some students told us that we should get a gazetteer, a Biblical gazetteer. Somebody else gave us the most helpful hint - they told us Paul was in the second half, in the new part. The next morning Benny and I pooled our resources and we bought a gazetteer. You know what a gazetteer is - it shows maps of the Mediterranean area and all of Paul's travels.

We began to read the New Testament and got through Matthew, Mark and Luke and finally got to what Paul had done. We stayed up all night before the examination reading the New Testament and when the sun came up Benny and I had all the confidence that students can ever have before an examination because we could place old Paul anywhere on the road from Rome to Macedonia at any point in his career. We walked into class rather confident and sure of our B at least.

Professor Rudisell came in and he looked back, kind of turned his eye and looked back and remarked that it was good Benny and I had come that day. Then he went to the board and he wrote these words, "Criticize the Sermon on the Mount".

Well I had never heard of the Sermon on the Mount, let alone be able to criticize it, and I thought for a moment about what I should do. This was indeed an instructional dilemma, a learning dilemma. I thought about praying, then I thought, "No, praying would be the ultimate in sacrilegious behavior", so I declined to pray, but I did look around to see if any of my colleagues were writing anything that might be of value. They were not, so finally after 30 minutes, I rationalized that summer school wouldn't be too bad - I wouldn't have to go to work and there would be some cute girls - so I put my name on the paper, wrote Dr Rudisell briefly that I had enjoyed his course a great deal but that the Sermon on the Mount escaped me for the moment, folded it, and started up the aisle. About 6 seats in front of me was my buddy Benny, and he was writing furiously. In fact, Benny was on page 12. I walked outside and stood there for 2 hours watching Benny through the window in the door. Benny wrote for the entire 2 hours and 30 minutes beyond the exam period, and finally old Professor Rudisell stumbled over 4 rows of chairs and took Benny's paper from him.

Benny made an A on the course, and I went to summer school. The night before graduation we were having a little going away party for those graduating, and I said, "Benny, how in the world could you have made an A in that course? You know we studied together, but more important we did not pass together." And Benny said, "Well, maybe you'd like to read my paper?" and I said, "Indeed I would".

So I got Benny's paper and it read this way: Question: "Criticize the Sermon on the Mount" Answer by Benjamin T. Creed: "Let those who will criticize the words of the Master. As for me, I will discuss the travels of Paul".

There are a lot of morals to that story. For me, the moral is that it doesn't matter what you ask me to speak on - I'm going to speak about the travels of the Apostle anyway. For students, the moral of the story is that Benny figured out what Professor Rudisell's real objective was, and conformed to that, and did very well.

I want to take the rest of the time this morning to review with you some very basic kinds of assumptions regarding individualized instruction. Then I will come very quickly to two contentious issues in college teaching. I'll mention those issues in just a few moments because I think individualized instruction, or any other kind of instruction, is either effective or non-effective depending on your agreement with these two issues.

ROUECHE..cont'd

Perhaps the most basic assumption regarding community college students is this - that the aptitude, achievement, background and motivational levels of students in many community college classrooms are the most diverse to be found in any educational setting in the world. Last semester at Fort Worth, Texas, we looked at the reading ability levels of students in Freshman English courses and found that in any transfer English program the reading ability level ranged from Grade 4 to Grade 14. It seems evident then that no matter what type of group instruction is used, it is probably going to be ineffective for 60% of such students because of that kind of diversity.

A second assumption I would mention is that people learn in different ways and at varying rates of speed. There is nothing new or unique about that except that it is true. Somehow instruction must accommodate individual differences. The task of good instruction in the community college is to accommodate whatever learning assets the students bring with them. And there is no best single method for teaching all students.

The third assumption I would make is that people learn best by doing, by active involvement - active participation in a learning process. Passivity is not conducive to changing student behavior. We've known that for 50 years and yet we continue to keep students in passive roles where they are sponges to soak up whatever the teacher is throwing out. Individualized instruction makes the student an active learner, an active participant in the learning process.

A fourth assumption has to do with retention. The assumption states simply people will not retain what we teach unless it is relevant or essential to their life's activity.

About two months ago, my neighbor's little boy, who is in the 5th grade, came over to our backyard and said, "Dr. Roueche, I know the capitals of all the States in the United States". Before I could say how impressed I was, he rattled them off - named all 50 - and his mother was saying, "Isn't it nice. He knows all the capitals now, and has also memorized all the Presidents and Vice-Presidents". And I said, "Yes, but ask him to recite that list for you in a few weeks". Take all of your A students some semester, for those of you who teach, and give them the end-of-semester examination questions two weeks after the end of the semester and see how much retention there is. We know more about forgetting than we do about learning. We know that we don't remember those things that don't have pertinence or relevance to our everyday life, those things that we don't develop interest in. That's a very key assumption.

A fifth assumption underlying individualized instruction is that previous student grades tell us little if anything regarding student competency. In other words, we don't know what the grades represent outside of a judgment by a teacher at some point in time. What does a B in English mean to you? What does a C in History represent? We don't know what skills we've been measuring because those grades are not tied to any kind of objective or discernible outcome.

The sixth assumption that I would define is that teaching is a science requiring tools, technology and specific skills on the part of the teacher. We know a great deal about motivating students and causing people to learn, but frankly most teachers have not been prepared for this kind of assignment in a community college.

The seventh assumption I would make regarding individualized instruction is that learning to be effective needs to be targeted and purposeful to the student. There has to be some reason or rationale to the learning activity. And this is one reason why behavioral objectives or measurable objectives or specified outcomes are so important. Student and teacher alike become more effective once the direction of learning activities is agreed upon.

These are probably very elementary kinds of assumptions to you and yet I submit they are crucial in designing successful learning activities for students in the community college.

I want to turn now to what I regard as two major contentious issues in college teaching in community colleges. The first issue is the simple statement that students can learn. If you accept Benjamin Bloom's notion of mastery learning, then 95% of our students can learn. The second issue I'm going to talk about has to do with teacher attitudes, teacher expectancies. Stated very simply, what the teacher believes to be true regarding the learning abilities or capabilities of students more than anything else determines the level of student achievement. Teacher expectancy is the key to student achievement in any classroom. I'm going to relate to you some research concerning this particular issue.

Five years ago, I did a national survey of developmental studies for remedial educational programs in the United States. At the beginning of our survey we wrote to all the community and junior colleges listed in the AAJC directory asking several questions. The first was, "Do you have programs for students who enter your college with deficiencies?" Over 800 responded to that question in the affirmative - that is they either had individual courses or they had programs specially designed for students who had enrolled with some kind of academic deficiency in mathematics, English or what have you. We found in that survey that the most offered course in the American community college in 1967 was remedial English. We found that the second most offered course was remedial reading. The third most offered course was remedial mathematics.

We estimated from the survey that junior colleges were spending somewhere between 20 and 25% of their total instructional dollars for programs designed to assist students with deficiencies - that is roughly 1/5 to 1/4 of all our money was going into staffing those kinds of courses. Similarly, 1/5 to 1/4 of all faculty were teaching students with some kind of academic deficiency.

I was impressed at the effort junior colleges were making to accommodate students with less than adequate academic backgrounds, but the questions I wanted to ask were these: "How long did students stay in the community college - how long did they persist?" Secondly, "How well do they achieve?", and third, "What is their attitude toward the open door college?" That led me to the bad news part of our study. We found that of the 800 colleges that responded affirmatively to the questionnaire, only about 20 had any written rationale or written objectives explaining the purposes of their program. Only 20. We found that only 5 colleges of the 800 had ever evaluated the effectiveness of the program. In fact, in 1967 some critics of the open door college, David Reisman and Christopher Jencks in particular, were saying that the community college was a con institution, that the students were conned into coming into the open door only to go out as quickly as they had entered. The revolving door college really came into vogue in 1967. Jencks said that community colleges deliberately did not evaluate those kinds of programs because community college leaders knew beforehand how disastrous the results of such an evaluation might be and that they would lose public support for their efforts.

We found in 1967 that the most successful remedial education program in the United States never had more than 10% of all the students who entered with a deficiency ever complete a program, ever earn a certificate, ever earn a degree. The attrition rate in 1967, as best we could estimate was 90%. The odds were 9 to 1 against any student who enrolled ever getting through two consecutive semesters. In fact in the colleges we looked at in depth, attrition rates in the first semester were estimated at 75%.

I ended that little report, which was called Salvage, Redirection or Custody?, with this kind of thought. Is it possible, is it honestly possible in one semester, or one academic year to remedy 12 years of educational deficiencies? It was an honest question. Here were community colleges spending millions of dollars in these programs with disastrous results. Can it be done - can you take individuals who have been unsuccessful and turn them into productive members of a society?

I have just finished, in fact last week, a five year follow-up to that study. John Gardner said in a speech at Southern Methodist University about a month ago that in 1980 we educators will look back with alarm and embarrassment at what constituted effective teaching in 1970. I think he's right and I think the results of the new studies tend to enforce it.

We've just looked at eight community colleges around the United States that have built developmental studies programs around the assumptions that I mentioned earlier in my talk. They have built programs designed to accommodate individual differences. I want to tell you briefly about our experimental design. We wanted to see what happens to the students who enroll with deficiencies. How long do they persist? One semester, two semesters, three semesters, four semesters? Do they ever complete a degree? What about their achievement? What about their attitude toward the program? I'll briefly summarize it for you.

We found that retention rates in the eight community colleges we studied ranged from 75 to 90%. That is 75 to 90% of all the students who enrolled with deficiencies in those eight colleges now complete those programs. In five years, that's a reversal of the percentage, an absolute reversal. We looked at colleges in Texas, North Carolina, New Jersey, Illinois and California. The worst program that we found of the eight built on good assumptions had a retention rate in the program of 75%.

More importantly, we compared those students with other students who had enrolled in the college three years ago with similar kinds of deficiencies but who chose not to go into developmental studies. The best retention rate we found for that group of students was 35% - that is, the developmental programs have been twice as effective in retaining students at those courses not built upon the kind of assumptions I have discussed. Secondly, we found that of those students who completed the developmental studies program, over 80% had better than C averages. In fact the mean level of student achievement in developmental studies exceeded in every college the average grade point averages of students in college transfer programs. More important, in the colleges that used standardized instruments to measure reading and mathematics, we found that in three colleges, students leaving developmental studies scored higher on these tests than did entering freshmen in transfer programs. In other words, the skills development for these students progressed to the point that they had better skills in English and Mathematics when they left developmental studies than students who had enrolled in the college and who had been determined not to need remedial work.

We asked unobtrusive attitudinal questions of the students - questions like this. "Did you like this program?" "Would you recommend it to your brother?" "Has it been meaningful, has it been relevant, what kinds of criticism would you offer?" The responses from students were 95% affirmative.

This has happened in the last five years. Now I do have some bad news to share with you. You've heard the good news; some of you may anticipate the bad news. It is simply this. When students leave these kinds of programs built around the kinds of assumptions that I've outlined, and go back into traditional classrooms, the attrition automatically increases and achievement declines immediately. Only in one college in Texas did we find that achievement and attrition levels remained fairly constant.

Now all of you are experienced educators. Why do you think that's true? Anybody want to hazard a guess? It may have something to do with the problem we have in criminal rehabilitation - of getting criminals rehabilitated to the point that they can become productive members of the society. We give them skills, we work on the self-concept, and then we send them back into the environment that contributed to their criminality to start with. Similarly, all of the anxieties that were developed through twelve years of traditional education come to the forefront again in the students' minds.

Let me give you an example. I was in a chemistry classroom in a lecture hall in a community college last spring. The Dean took me there. We were sitting in the last row listening to this chemistry professor introduce Chemistry 103. He said it was a tough course. He said, in fact that half of the students would never pass the course and went on to say, "Look around, look into the eyes of one another because most of you will never make it through Chemistry". After the class was over I walked down and greeted this fellow. I didn't greet him the way I would have liked to have greeted him, but I did ask him what his biggest problem was in teaching community college students, and he said, "Dr. Roueche, they're just not motivated".

Now here was a man who had just told his class, "I personally will kill half of you. I don't know which half, but I know that half of you are going to die in my course". We know today that a student's self-concept is probably more important in predicting his academic success than any aptitude measure we've ever used. Some research that we're doing at the University of Texas is showing us that how a student feels about himself - that is, how he perceives his ability to make it, how much control he feels he has over the learning situation - is more important than his high school grade point average, his SAT score, his SCAT score, his ACT score and so on. Those students who score high on self-concept skills do well in community colleges irrespective of academic background. And conversely, those students who enroll in community colleges with low feelings of self-worth don't do well, irrespective of their aptitudes. Now just put that chemistry situation in focus here for a minute. Here is a student who just got through developmental studies - the first time in his life that he's ever been successful. He had a teacher who cared about him, he had counsellors there to assist him to cause him to learn, to help him to succeed. Then he walks into Mr. Jones' chemistry class and Mr. Jones says, "I'm going to kill you". All of the old anxieties and all of the old fears spring forth in the mind of that student, and he says, "Well he's talking about me, I'm the one he's talking about and I won't make it."

We've known for some time that teachers have images of students in their minds and that what teachers believe to be true about students more than anything else determines the level of achievement.

ROUECHE.con't

I want to tell you about an experiment that we conducted three summers ago with a group of English teachers. We brought in 80 English teachers to teach them how to write behavioral objectives and how to individualize an English composition course, and our pretest was to have every teacher grade a series of compositions written in the creative writing classes at a major university. We had the creative writing department give us papers that had been given a grade of A by a grammarian, by a journalism professor, and by a creative writing professor.

We typed all of those papers and reproduced a set of twenty for every teacher in our group. The first day we divided the teachers into four different groups and we met individually with each of them. We told Group A that these were English papers written at a community college with a heavy technical orientation, and we gave them the objectives and the criteria to be used in grading the papers. We told Group B that these were papers written by students at a suburban community college which was a predominantly white, upper-class community college out in a very affluent area. Group C got the same papers and criteria but we identified the papers as being from an urban community college, probably one of the most mixed community colleges in the country, about 1/3 black, 1/3 mixed American, 15% Asian and the rest white. For Group D, we identified the papers as having been written by the creative writing class at the University and that only those students that scored 700 or better on the verbal aptitude portion of the SAT were in the course.

We didn't talk about students and we identified institutions only. Now what do you think the grade ranges were on the papers written by the students at the predominantly technical college? B to F, with a preponderance of C's and D's. At the suburban campus, the range was A to C; at the urban college A to F with a preponderance of C's and D's;

and at the University, A to B with 90% A's. Now you can imagine the chagrin and the overt hostility that those teachers exhibited when we convened them back together. We went up and put all the grade distributions on the board and then we told them the good news. And after one hour of some rather profane language on the part of the English teachers having to do with the ethics of Roueche and friends, one English teacher at the back of the room got up and said that for the first time in his life he saw that he was the problem, and it was one of the most productive workshops ever conducted.

We carried that kind of experiment even further at the National Laboratory for Higher Education in Durham. We worked with a group of English teachers in one community college and asked them, "What do you do here?" "Well, we teach students to read, write, speak and listen effectively." We said, "Can you do that?" And they said, "Of course we can, we're English teachers, we're prepared to do that." We asked if they could take students who weren't motivated and teach them to write a good paragraph. "Yes, that's what we're doing in grammar and composition". We asked if they were sure they could do that. And they said of course they could do that; were we doubting their integrity? And we said no, but we would like them to write for us one paragraph that embodies all of the characteristics necessary for a grade of A in their course. Well it took them about an hour to do it and they didn't really want to - they didn't want to write a paragraph.

We typed those paragraphs on plain sheets of paper, put them in a satchel and went on to the next community college English faculty which we dealt with and asked them to grade these papers written in a community college down the road last week. What do you think the grade ranges were friends? A to D. And then we said, "Well, you've just graded the English faculty at another community college just down the road.

The worst thing we ever did was to include paragraphs written by Pulitzer Prize winners of literature and ask English faculty members if this was good writing. (I'm not really picking on you English teachers; we could do the same thing in history or chemistry or what have you.) Hemingway's Old Man and the Sea always gets A to F grades, and it s only when you tell them that you've just graded Old Man and the Sea as F that the teacher begins to see that he is part of the problem.

Rosenthal in 1968 wrote a beautiful little book called Pygmalion in the Classroom. If you haven't read it, read it, because the book is nothing more than a series of case studies of these kinds of research projects pointing out that what I as a teacher and you as a teacher believe about our students, and the images we have in our minds regarding their ability to learn, more than anything fixes the level of their achievement. A new book called Pygmalion Revisited further corroborates the fact that merely mentioning a doubt you have in your mind to a colleague about a student will reduce the student's grade point average several points. I very carefully advise all my graduate students at the University of Texas to make A's the first semester, to be studious, to look diligent, to look serious, because the moment you're identified in the mind of the faculty as an A student, the word is out. All our students do well if they promote that image.

To sum up, I think that no matter what method of instruction you choose to use in your own teaching - and you really have that freedom - the real test of effective teaching is whether or not your students learn. People ask me about teachers who don't care to individualize their instruction - whether they will be effective. My answer is probably not, ROUECHE..cont'd

because teaching is people business and probably the prime ingredient in being a successful teacher is the four letter word, C A R E. Caring about other human beings to the point that you're willing to do everything possible to assist them to make it in life - to be successful. Unless the dimension of caring is there, and caring can be further defined as giving a damn, probably no method of instruction is going to be effective.

Thank you very much.

A BRIEF OVERVIEW OF THE OPEN UNIVERSITY'S TEACHING SYSTEM

Professor Brian N. Lewis
The Open University

The Open University is the newest and, in consequence, one of the least understood of British Universities. It has the same legal status as any other British University. But it's Royal Charter was granted only 3 years ago, and its first intake of (25,000) students did not commence their studies until January 1971. The purpose of this paper is to highlight some of the University's most distinctive characteristics, and to indicate its overall organizational structure.

1. What the University Offers

The Open University (OU) constitutes the first attempt, in Great Britain, to establish a full-scale multimedia system of higher education.

Through the provision of correspondence materials, radio and television broadcasts, home experimental kits, and the like, the University is enabling a large number of adults to study for degrees (and other higher education courses) in their own homes, and on a part-time basis.

To strengthen its home study programs, the OU has set up over 250 local study centres where students can meet to study, and to discuss their study problems either a) among themselves, or b) with specially-appointed tutors and counsellors. As a further strengthening of the overall tuition programme, the OU also arranges annual summer schools - short residential courses of one week's duration - in different parts of the country.

To obtain a degree at the Open University, a student must accumulate 6-8 course credits. To do this, the student must successfully complete 6-8 courses of study, at a rate of not more than 2 courses per year. Each course calls for about 10 hours of home study per week, sustained over a period of about 9 months of the year. So all students are able to accumulate the required number of credits in their spare time, if they so desire.

In its first year of teaching (1971), the OU initiated degree courses in the Arts, Social Sciences, Mathematics, and Science. In its second year of teaching, degree courses were also started in Educational Studies and Technology. Six course credits secure a general (B.A.) degree, and eight course credits secure an honours (B.A.) degree. In certain cases, students can be granted exemption from 1-3 of the lower-level courses, and this reduces the time needed to qualify. In summary, it will take at least 3-4 years for most students to obtain a degree. And every effort will be made to allow the slower student to complete his degree at his own rate.

In the near future, professional training and "up-dating" courses will be run - e.g. in Business Management, Education, Administration, and in various branches of Technology. The first of these are already being prepared, and later ones will be determined by public demand and available resources. They will be of shorter duration (requiring, say, the accumulation of only 1-3 course credits), and will lead to the award of certificates or diplomas. A postgraduate programme, leading to the award of higher degrees, has also been launched. In all cases, the OU aims to use essentially the same kind of "teaching at a distance" multi-media approach.

It is worth adding that the Open University's courses are in general designed to have practical application in the real world. They are seeking to meet genuine social and economic needs, and they should therefore be of practical value both to the student and to potential employers.

2. Who the Students Are

As already indicated, the OU is first and foremost an Adult Education Facility. In the years to come, it may well be both possible and desirable to accept ordinary school leavers in (say) the 16-18 age range. However, the 16-18 range is already well provided for, so the initial intention is to admit nobody under 21, unless there are exceptional circumstances (e.g. of physical disability) which would prevent a person under 21 from gaining acceptance elsewhere.

In its efforts to offer higher education to as many adults as possible, the OU has waived many of the traditional entry requirements. It therefore caters for a large number of people who might otherwise be discouraged (or prevented) from pursuing degree courses. These include adults in full-time employment, housewives who find it hard to leave their homes, persons who do not have the usually-mandatory school-leaving certificates, persons who are physically handicapped, and persons who live too far away from already-existing colleges of higher education. Among the full-employed part-time students, there is already a significant number of adults who are looking to the Open University a) to provide qualifications for an alternative career, or b) to provide the kinds of specialist up-dating and retraining courses that have already been mentioned.

The implications of such a radical "open door" policy should not be overlooked. It gives rise to a highly heterogeneous population of students - of varying age levels and interests and backgrounds - and adds greatly to the complications of teaching effectively at a distance.

3. What The Study Materials Look Like

Study materials are parcelled up and sent through the post to the student, at intervals of about 4-6 weeks. Each package contains a sequence of correspondence materials, accompanied by study notes, exercises and experiments, and self-administered comprehension tests which the student can take to help satisfy himself that he has understood the main teaching points. Also included is a set of written homework assignments which the student is expected to return, within a specified time period, for marking. Some of these assignments are marked directly by the OU computer, and others are marked by specially-appointed part-time correspondence tutors.

The "core" correspondence materials are usually written by members of the OU's central academic staff. The remaining materials consist of carefully-chosen extracts and offprints, taken from standard textbooks and other professional literature. Each package also contains discussion notes (which the students are invited to discuss among themselves), and recommendations concerning suitable follow-up reading. Additional materials in the form of audio tapes, long-playing records, and transparencies are included in some study packages.

Most study materials make a special point of giving the student a variety of things to do. Tasks are set which can take the form of pencil-and-paper tests and exercises, scheduled observations, group discussions, home experiments, local fieldwork, and the like. The aim of such tasks is to create experiences in the student which help to confirm and consolidate the knowledge purveyed by the printed texts. In particular, all science students receive a comprehensive home experimental kit which requires controlled and systematic use and reportage.

So far as is possible, each study package is a self-contained entity. It provides the student with everything that he needs, in order to advance his studies for a further 4-6 weeks. In some courses, it has been found necessary to refer the student to "set books" that he is expected to buy or borrow from his library. But the study package constitutes, in general, the core materials of the course.

4. The Role of the British Broadcasting Corporation - an Educational Partnership

To reinforce and supplement the packaged study materials, the University is collaborating with the BBC to produce a regular series of radio and television programmes. At the present time, facilities exist for the transmission of one radio and one television programme per week, in respect of almost every main course that the OU is planning to run. Transmissions occur mostly at off-peak listening and viewing times. Each programme is initially broadcast in the early evening of a weekday, and is then repeated on a week-end morning. So every student has two opportunities to listen and view. This is a substantial undertaking which greatly enhances the effectiveness of the written study materials, and which may well be expanded in future years if more radio and television channels become available.

Radio is used in a variety of ways - to orientate the student towards studies that he is just about to commence, to discuss subjects that are inadequately dealt with in the correspondence materials, to recapitulate or summarize materials that have already been studied, and so on. Radio is also used to communicate with students at short notice - e.g. to clear up recurring points of difficulty, or to make announcements of interest to certain sections of the student population. Occasionally, arrangements have been made for nation-wide hook-ups between central administrative and academic staff, regional staff, and volunteer student spokesmen. These are the so-called Open Forum programmes.

Television is most appropriately used, of course, to convey information that requires special visual effects. Lectures and demonstrations which involve the use of special (e.g. scientific) equipment, small group discussions on matters of controversy, visual accounts of the Arts and Sciences, of developing technology, of political and economic and educational systems, of unfamiliar countries and societies and civilizations, of our own (and other people's) historical and cultural heritage - these are just a few of the subject matter areas to which television has usefully been applied. Television, like radio, has the capacity to bring "live" education into the student's own home. Correctly used,these media can do much to add a dynamic and personal flavour to the tuition, and they help to foster a sense of participation and involvement in a major national venture.

5. Tutors, Counsellors and Study Centres

To provide more personal support for those who feel the need for it, the OU has set up nearly 300 study centres throughout the country. These typically consist of a small number of rooms that sympathetic authorities (local colleges of education, for instance) have hired out to the University for purposes of study and discussion. All centres are equipped with radio and television receivers. Many of them also contain tape recorders, projectors, a library of the broadcast material in recorded form, and computer terminals for the use of mathematics students. Each centre is regularly visited by specially-appointed Class Tutors and Counsellors. These are professionally qualified people (lecturers from nearby colleges for example) who are appointed on a part-time basis to hold seminars and discussion groups, and to advise on the various problems - both academic and personal - that individual students might be encountering. Every effort is made to keep study centres open at times (throughout the evening for example) which are most convenient to all concerned. Discussion groups and the like are also held at these times. The whole study centre operation is coordinated and monitored by circuit-riding Senior Tutors and Senior Counsellors who are full-time members of the Open University staff.

The number of part-time staff associated with any one study centre is not of course, large. But every student has several chances every month to discuss his problems - either individually, or in small group discussion - with the appropriate part-time member of staff. If a student is unable for some reason to attend a study centre, special arrangements can be made to visit that student (albeit infrequently) in his own home. Part-time staff therefore operate rather like doctors. At certain times of the week they are out visiting "emergency" cases. At other times of the week they are available for consultation at a study centre.

Attendance at a study centre is advisable, but not compulsory. At the present time, study centres are located mainly in well populated areas, so that the majority of students are always within a few miles of such a centre. As indicated above, many study centres consist of rooms hired in some nearby college of higher or further education. This incidentally brings OU students into contact with other student bodies, and it may eventually lead to an extension of study centre facilities. If the demand arises and if resources permit, every effort will be made to enrich the OU's study centres - e.g.by adding library books, laboratory equipment, and other learning resources. Additions of this kind will be easier to make if the study centres are already housed within educational centres that sympathize with the OU's general aims and objectives.

6. Residential Summer Schools

The educational resources so far described (correspondence materials, home kits, radio and television programmes, and study centre discussions) are intended to be sufficient, by themselves, to promote effective learning. Even so, a case can be made for getting students together in much larger groups a) to convey something of the traditional "university experience", and b) to achieve certain additional objectives that might otherwise be neglected. The OU has accordingly devised a system of one-week residential summer schools, which are held at host Universities in different parts of the country. Summer schools are compulsory, and they are currently being arranged to take place during the summer vacation of the host Universities involved.

Each school caters for several hundred students drawn from different parts of the country. Although the period of residence is short, several noteworthy objectives can be achieved. For example, OU students have the chance to use and savour the host University's facilities - fully equipped laboratories and demonstration rooms, large-scale lecture halls, reference libraries, and the like. Central academic staff also have an opportunity to meet students *en masse* and individually, and this can provide useful additional feedback on student attitudes and progress.

Summer schools can serve a variety of useful purposes. They can provide opportunities for intensive laboratory work, using a full range of standard equipment. They can provide opportunities for special project work in, for example, the Social Sciences. They enable large scale exhibitions to be set up, and visits to be arranged to places of cultural or scientific interest. They provide a forum for mass discussion on matters of difficulty or dissention. They enable distinguished visitors to give invited addresses.

They provide opportunities for setting and discussing and evaluating special homework assignments. They provide opportunities to re-run radio and television programmes that students may have missed. And they provide additional opportunities for members of staff to engage in diagnostic and remedial teaching.

Above all, courses of this kind enable students to get to know each other, and to exchange views and experiences. This can have a strong motivational and integrative effect on the student population as a whole. And it can help to counteract any tendencies (induced, perhaps, by the study centres) for the student population to fractionate into small inward-looking groups. Similar comments apply, of course, to the numerous members of staff - academic and administrative, full-time and part-time, central and regional - who attend the various schools that are run. These members of staff are able to meet each other, and to meet a wide cross-section of the student population, all at first hand.

Evidence from other countries suggests that attendance at a summer school, even for a short period of time, can have a notable educative effect. It can also boost student morale (even if the students spend most of their spare time gossiping and grumbling), and it can help to promote a sense of corporate identity. Home study is, at the best of times, hard going. The rallying effect of a well-run summer school should not be underestimated.

7. Students as Teaching Resources

No account of the University's teaching resources would be complete without some reference to the students themselves. Most students tend to be regarded solely as learners - often as passive and inadequate learners who ideally need to be carefully nurtured by expert teachers and great minds. In reality, students are a potent and much-neglected teaching resource. If a University's formal teaching resources (its lectures, set books, and the like) are in any way defective, and if no teacher is around, students are obliged to do the teacher's job for him. They must acquire the skill of extracting information from books and journals and from each other, and they must use each other as sounding boards for their own developing opinions and expertise.

The most successful students all tend to pick up these self-help skills at a fairly early stage. At the OU, study centres undoubtedly help to foster the development of such skills. By means of small-group discussions, students are more able to discover and question hitherto unrecognized assumptions in the subject matter they are studying, and to uncover gaps and limitations in their own knowledge. They also have the chance to pursue lines of enquiry which are of special interest to them, but which are dealt with only lightly in the main study materials.

One of the best ways of learning about a new subject is to try teaching it to other people. There are, of course, some obvious dangers in the method. If nobody in the group knows what he is talking about, group discussion will merely produce a sort of "pooled ignorance". On the other hand, carefully prepared study materials, duly backed up with annotated discussion notes and easily-accessible follow-up reading, can enable students to hold profitable small-group discussions even when no tutor or counsellor is present. Students are a teaching resource in the sense that they a) compensate for deficiencies in the resources provided by the University, and b) help other students to extend and apply their newly-acquired knowledge in accordance with the needs and interests and abilities of those students. Considerable effort is being made to ensure that the study centres provide a suitable environment for the conduct of such activities.

8. Organizational Structure of the University

The headquarters of the Open University are being developed in a rural setting, some 50 miles north-west of London. The exact site is on the outskirts of the designated area of the new city of Milton Keynes, in North Buckinghamshire. It is close to the M1 motorway, some 4 miles north-east of Bletchley.

Modern buildings, which have only recently been erected, are currently housing several hundred academic and administrative staff - together with a large-sized data processing and record-keeping system, and extensive facilities for the design and production and dispatch of the University's study materials. Also nearing completion are research laboratories (for academic members of staff), a lending and reference library, lecture halls, canteens, and so on. There are no undergraduates on site, but room is currently being found for a small number of residential post-graduates.

To control and monitor a nation-wide home study system, a rather elaborate organizational structure is required. For this reason, the University has divided the country into 12 semi-autonomous regions. Each region has its own Regional Head Office, staffed by a Regional Director and other senior administrative and academic personnel. Each Regional Office maintains detailed records of all students coming within that region, and the Regional Office staff are responsible for coordinating all the University activities (tutorial, counselling, study centre, summer school, etc.) that go on in that region.

The formal structure of the Open University is therefore hierarchical. Part-time tutors and counsellors are responsible to the Regional Office staff who are in turn responsible to the University's headquarters at Milton Keynes. In practice,of course, the real structure is heterarchical. Control over the University's affairs fluctuates around the system and, ideally, always tends to reside with the person (or group of persons) best qualified to act.

9. The Assessment of Student Performance

The OU has departed from the traditional practice (in British Universities) of relying almost exclusively on formal end-of-year examinations. It has also tried to recognize some of the many limitations of traditional numerical marking schemes. And it has taken account of the needs of adults who are struggling to study at home in their spare time, and who therefore feel the need for regular feedback on their progress. In the light of these considerations, the OU has chosen initially to operate a "continuous assessment" procedure, using (in most cases) grades rather than numerical marks.

As already indicated, all study packages contain homework assignments which students are expected to return, duly completed and within specified time limits, for marking. Some of these assignments are in computer-markable form, and students are requested to post these directly to the OU's headquarters at Milton Keynes. The remaining assignments are sent to the special group of part-time staff mentioned earlier - namely the local correspondence tutors.

Performance on homework assignments is recorded, for each student separately, on computerized student record files. If a student has undertaken any special work assignments (e.g. at study centres, or summer schools), then the marks obtained for these special assignments are likewise recorded individually. At the end of each study course, all students are required to attend at an Examination Hall to take a short examination (of about 2-3 hours duration) under properly supervised conditions. Marks obtained at this examination are then compared and combined with all the other marks that the student has accumulated, over the year. Finally, a weighted composite mark is calculated to decide whether a course credit should be awarded and, if so, whether it should be awarded "with distinction".

It is worth bearing in mind that the continuous assessment procedure, together with the week-by-week flow of essential radio and television programmes, can have a powerful and sometimes oppressive pacing effect on the student population. The imposing of time limits on homework, and the steady sequence of synchronized BBC broadcasts, constitute a strong inducement to students to keep up to date with their studies. In recognition of the fact that some students may fall behind with their work for reasons that are beyond their control, all students are allowed to skip a small number of assignments if they so desire. In effect, this means that the award of the overall continuous assessment grading is based on (say) the best half-dozen assignments that each student sends in.

10. The Handling of Assessment Data

Computer marked assignments consist of multiple choice (and similar) questions that can be answered simply by making a series of marks on specially designed answer sheets. Students post these answer sheets, duly completed, to the University's headquarters. They are then decoded by an automatic document reader, and evaluated by computer.

Tutor marked assignments consist of essay questions and short answer questions which, by their very nature, cannot be marked by computer. Students must therefore post these assignments to designated correspondence tutors, who are responsible for marking them in accordance with general guidelines laid down by the University's central academic staff.

For each homework assignment that is received, the computer generates a detailed statement of how well the student has done a) on individual questions, and b) on the assignment as a whole. At the present time, the OU computer has only limited facilities for interpreting the homework data that it receives. However, a variety of computer programmes are currently being developed to enable student progress to be evaluated with greater sensitivity - e.g. by showing which questions, and which groups of questions, cause the most difficulty to which kinds of student. At the level of the individual student, cumulative indices of success and failure are also being devised to show how well each student is doing (in comparison with other students, and in comparison with his own past performance) at each stage of the course. It will then be easier to detect those sections of the course on which the students do best (or worst) and also to detect any sudden improvements or deteriorations in individual performance. If successive course units tend to vary unevenly in content or level of difficulty, this should also be more easily detectable.

From time to time, the computer generates summary statements - both to Regional Offices and to the students themselves - showing how each student is progressing. If any student shows evidence of sudden and severe deterioration, emergency signals are sent to the Regional Office, so that the student in question can be contacted and offered help.

Similar initiatives can be taken by the correspondence tutors, and by all other part-time members of staff. As a matter of routine, the correspondence tutor posts the student's homework back to him, duly marked and annotated, as quickly as possible. At the same time, he sends a record of his marking (and any further relevant comments) both to the OU's headquarters and to the Regional Office. The part-time tutors who attend study centres, and the counsellors who also attend study centres, can likewise report back on the progress of individual students. It follows that both the Regional Office and the OU's headquarters can accumulate a large amount of information about student progress - information which flows in from a variety of sources, and which needs to be sorted and interpreted by the kind of software now under development.

11. The OU As A Self-Improving System

When students return their homework assignments, they are regularly invited to register their opinions on the intelligibility, difficulty, and interest of the materials they have been studying. They are also invited to say whether, and to what extent, they have made use of the OU's study centre facilities. At the same time, the part-time members of staff - the correspondence tutors, the tutors who attend study centres, and the counsellors - are asked to comment on the students that come under their care, and on the study course as a whole. In particular, part-time members of staff encourage students to talk about their academic and personal study problems, so that the OU can build up a more accurate picture of student needs and interests.

To induce feedback of this kind, and to secure more specific types of information, the OU occasionally sends special postal questionnaires to representative samples of students. If resources permit, it is also hoped to set up consultative panels of students, and to have fully trained interviewers and social workers circulating around the system. There is, in fact, already provision in the Royal Charter for the convening of Regional Assemblies, and for student representation on the Senate. Arrangements have also been recently completed for the starting of student magazines and newsletters.

Although the student population is scattered across the whole country, the numerous feedback channels make it comparatively easy to gather a great deal of information a) on academic and personal study problems, b) on the strengths and weaknesses of the study materials, c) on the effectiveness of the tutorial and counselling and study centre facilities, and d) on the conditions under which the students are most likely to succeed or fail. Data obtained in this way are helping the OU to strengthen its instructional system fairly rapidly, from year to year.

In this connection, it is worth noticing that the OU has many of the characteristics of a Direct Action Research Project. Instead of opting for time-consuming "feasibility studies" on multi-media systems of higher education, the British Government took the imaginative step of actually allowing such a system to be set up and run. The result was a high-risk undertaking in which mistakes were bound to occur and to go on occurring. But, in the long run, this could well be the most effective way of solving the many intricate problems involved. The risks can be greatly reduced, of course, by employing monitoring and research procedures which are explicitly geared toward improving the teaching system. In recognition of this point, the OU has established its own Institute of Educational Technology which, among other things, has primary responsibility for guiding and informing the somewhat agonizing process of self-improvement.

12. Concluding Remarks

The OU is an ambitious project. It is trying to come to grips, at one and the same time, with a whole cluster of pressing educational problems. It is seeking to bring higher education to adults who prefer (or are obliged) to study part-time in their own homes. It is aiming to do this for adults who have none of the usual entry qualifications. And it is relying for its success on the novel deployment of a wide range of educational and mass media resources. Any one of these aims poses a variety of unsolved problems. Collectively, they have a daunting appearance.

If the venture succeeds, it could have far more significance than might appear at first sight.

First, there is the economic significance of the undertaking. If correspondence materials and radio and television can be put to effective use, it could be at least 2-3 times cheaper (as well as being more convenient) to teach degree courses in this way. There could be susbstantial spin-off effects from the sales of well-validated teaching materials - sales to publishers, and sales to other educational institutions both at home and abroad. Since most students would be partly or fully employed during the day, it also follows that the cost to the economy would be less. The OU could therefore prove to be a highly cost-effective way of extending higher education in accordance with social and economic needs.

Secondly, the OU has considerable educational significance. Unlike what happens in other universities, the OU's instructional materials are open to widespread public scrutiny. Whether they are good or bad, they are likely to provoke a great deal of valuable thought and discussion. Since many non-students will presumably be tuning in to some of the radio and television programmes, they may also be a significant booster effect on the educational standards and sensitivities of the population as a

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whole.

Thirdly, there is the social and humanitarian significance of the venture. Even if the OU served no economic purpose at all, there might still be thousands of people who come to see its courses as a means to self-fulfilment. The social value of alleviating frustrations and boredom in the home should not be underestimated. An essential feature of any "ideal" society is that it should provide people, throughout the whole of their lives, with continuing opportunities to extend and change their interests and abilities. If the OU succeeds, it could play a central role in providing the kinds of opportunity that many people need.

Major innovations invariably provoke comments from people who have some axe to grind. In the case of the OU certain commentators have focussed on the economic significance of the venture - seeing it as a cheap way of bringing higher education and retraining facilities to large numbers of people. Others have seen the OU as a sort of "forcing input" to the educational system - the precursor of many such multi-media systems, and a possible basis for re-appraising and even revolutionizing traditional aims and standards and methods. Others have dwelt on the social justice of offering higher education to people who might otherwise be unable to secure it. Many commentators are sceptical of the OU's chances of success, but very few are disinterested.

Perceptions of the OU tend to vary according to the differential weight attached, by the perceiver, to its distinctive economic, educational, and social and humanitarian features. In reality, all these features interact. And it would be a pity to stress just one feature at the expense of all the others.

For example, it has been estimated that the half-life of many degree courses (especially in scientific and technological subjects) is currently running as low as 3-5 years. This poses considerable problems. If half the formal content of a degree course is out of date within 3-5 years, the value of the degree is greatly diminished. Moreover, the graduate who slowly rises (over 10 years, say) to a senior executive position, will find his authority increasingly undermined by the arrival of new graduates, in junior positions, who are technically more knowledgeable than he is. The provision by the OU of regular up-dating courses could therefore meet a large number of needs - social and humanitarian, as well as economic and educational. In other words, it would be an oversimplification to see the provision of up-dating courses solely in economic or educational terms. As usual, there is more to such a provision than meets the eye.

THE CANADIAN COLLEGE SCENE
A PANEL DISCUSSION

M. Jacques Fournier, Executive Director, Association of Canadian Community Colleges

Mr. Harry Pankratz, Executive Director - Instruction, Vancouver City College, Vancouver, British Columbia

M. Léonce Marcotte, Directeur-Adjoint, Services Pedagogique, Collège André - Laurendeau, La Salle, P.Q.

Sr. Irènè Léger, Recteur, Collège Jésus-Marie, Shippagan, New Brunswick

Mr. John Koski, President, Cambrian College, Sudbury Ontario

Dr. Mervyn Eastman, President, Red Deer College, Red Deer, Alberta

FOURNIER

I'd like first to express some personal feelings regarding our presence here in Sarnia. We're really delighted, as an Association of Colleges, to be able to participate in not only a national event, but an international event, and I think we should have lots of fun together. Now I'd like to introduce the panel: Harry Pankratz is the Executive Director of Instruction at Vancouver City College; Mr Léonce Marcotte is from a newly created CEGEP in Montreal, André Laurendeau; Sister Irène Léger, the President of Jésus-Marie College in Shippagan, New Brunswick; John Koski, President of Cambrian College in Sudbury; and Dr Mervyn Eastman, President of Red Deer College in Red Deer, Alberta, right between Calgary and Edmonton. I think we'll start with Harry to get the view from B.C.

PANKRATZ

Thank you Jacques, ladies and gentlemen. In British Columbia there are basically three types of two-year colleges.

The first type, for example, Prince George College in New Caledonia, is co-terminus with several school districts. We have about seven or eight of these. The second type is one whose borders are co-terminus with one municipality. Vancouver City College, which I'm representing, is an example of this case, and Camosun College in the city of Victoria is an example of the first. The third type, of which we have one example, is similar to Ontario's Ryerson Polytechnic.

The B.C. colleges are quite similar to American community colleges, and the British Columbia scene can be compared to that in California. In other words, we do just about everything that post-secondary students want to do - literacy training, up-grading, university transfer, career education, adult retraining, evening programs and general education - you name it, we've got it.

If we haven't got it, it doesn't take very long in British Columbia to get something off the ground, except that now we are facing a provincial government regulation saying that they want to have 18 months notice before we mount new courses. This may cut our ability to respond quickly.

As far as governing bodies go, we call ours College Councils. In most instances, two of the College Counsellors are appointees of the provincial cabinet, another one is usually the Superintendent of Schools, representing the provincial Department of Education, and the others are elected school-board trustees appointed by the School Board. In our case this is one board, and in other cases, one representative from the several school districts that make up the college district.

With regard to legislation governing the colleges, although we have a Universities Act, there is no College Act. We have a Public Schools Act which doesn't really apply, with the exception that a chapter has been appended to cover the Colleges. The British Columbia Association of Community

Colleges is meeting in Vancouver this coming weekend and one of the resolutions is precisely this, that the provincial government be urged to set up a B.C. College Act.

Prior to 1965, the provincial government had established a good number of vocational schools in British Columbia, and in 1965, 1966 and 1967, the community colleges came along. In approximately 1969, a white paper was issued by the provincial office indicating that the government felt that it would be appropriate for the vocational schools and the colleges in British Columbia to "meld". Meld is the word that has been used, and this melding process has been going on.

Vancouver City College, for instance, is considered a melded institution now. Nothing magical took place; a letter was received from the provincial office indicating that this was the case. The majority of the colleges in British Columbia are now melded.

With this of course, came several problems. Vocational instructors, for example, were not teaching on the same schedule - their hours were different, student contact hours differed considerably, annual vacations were different from Colleges and salary scales were different. The melding process has introduced a fair number of problems with the general administration as far as the provincial office is concerned.

Generally we see the melding process as giving the students an opportunity to transfer from one stream to another without too much loss of credit, for instance from the vocational to the academic. In the past, students had to drop out so we see this as a real advantage. They can transfer very easily in the first three or four weeks of college.

One of the great benefits as far as the melding process is concerned, is the common base it provides for support services that are available to each of our divisions. Vancouver City College, for example, has four campuses plus the

Community Education Services which operates out of an office and uses community facilities, community centres, high schools, church basements, etc. So far as we're concerned, we've been able to draw together the services, and in doing so we actually have attempted to unite our several divisions. We still have many problems, and I think they will probably continue for the next several years. I don't know how some of them will be resolved - maybe simply by retirement taking place. Thank you.

FOURNIER

Thank you very much Harry. Now we'll ask Léonce Marcotte, the Academic Dean of André-Laurendeau in Montreal, to describe his college.

MARCOTTE

Thank you Jacques, ladies and gentlemen.

The college is situated in Ville La Salle and covers Verdun, La Salle, Lachine and Dorval. For the people who know a bit about southwest Montreal, you know there is a lot of industry in that part of the city, so we expect about 75 or 80 percent of our student population to go into the technology field.

Our drawings have been accepted by the government and we plan to start construction at the end of December on our building, which will be six storeys, around 450,000 square feet, and costing around $50,000,000.

By the way, I want to tell you that at this point, we have no students yet, and so therefore no problems.

The Resource Centre will be a key location in the building and will combine the library, audio-visual facilities, and data processing. We expect that putting these three areas together will be a great help to our students.

As well as making use of advisory committees, we have established good relationships with companies in our area and have carried on discussions with them about types of facilities we are installing.

We are going to take a middle course between traditionally and completely individualized instruction. For instance, for a 45-hour semester course, we probably will have about 15 hours instruction in a classroom with a teacher, another 15 hours spent in seminar discussion, and the remaining third of the time will see a group of two or three students working together. In some cases it will only be one student, depending on the work he has to do. All the time, of course, the teachers will be there to help students.

To help students in this kind of program, we will use films, slides, books and computer-assisted instruction.

We are exploring the use of cognitive style mapping as well.

Next September, we will be starting some continuing education courses, and the college as a whole will get under way in 1974. Thank you.

FOURNIER

Merci, Léonce. Now I'd like to ask Sr. Léger to tell you about her nice little college on the coast of New Brunswick.

LEGER

I am sure that a great majority of you have never heard of Shippagan, but I'm sure that if you came to Shippagan that you would like it. Perhaps on July 10 the sun will contribute and put us on the map because there will be an eclipse of the sun then and the best place to watch the eclipse is in Shippagan. Scientists have already begun to set up equipment to observe the eclipse.

If we talk of community colleges in New Brunswick, maybe we should talk of their non-existence because there are no community colleges as such. We have two technical institutes in New Brunswick, six trade schools, a school of fisheries, and a forest ranger school, and these are dispersed throughout the province.

In Shippagan, a little town of 3,000 population, we serve a French population of around 40,000 in a radius of 25 miles. We opened the college in 1960 to try to bring some culture to that part of the province's French population. Up to 1960, only two girls had been able to get a college education. Since 1960 we have graduated over 150 girls who could get their BA degree.

We strongly feel that we should move in the direction of becoming a community college and are studying programs. In September we are going to admit boys to the college and in September 1973 we will become a junior college - up to now we have given up to four years of college - with the hope that we could go into technical, vocational, bilingual, secretarial and administration programs. We have three big secondary schools in the area which are very well organized and we have permission from the Department of Education to use all the facilities.

Our college from the start has been very much community-oriented. People are very much involved. From the very start, we had a Board of Advisors which has been very dynamic. We have just a very small staff of fifteen teachers, and we thought that coming to this Institute would help us meet with you people and discuss problems and get much better acquainted with the concepts of community colleges and how to go about it. Thank you.

FOURNIER

Thank you Sister Léger. I hope that a good many community college people go down to your place to see the eclipse.

Now John Koski, President of Cambrian College in the northern part of Ontario, will tell us a bit about his past five years.

KOSKI

I'm going to very briefly cover some of the history of the development of community colleges in Ontario and then I'll talk briefly about Cambrian.

I think you are well aware that in Ontario the legislation establishing the Colleges of Applied Arts and Technology was passed in 1965. The publicity coming out on the press at that time said that we were developing twenty "instant" colleges and there was very little reference made to the historical development which enabled Ontario to establish these twenty colleges.

The establishment of the colleges evolved out of the development of the Institutes of Technology and the vocational centres of Ontario. The major inputs to the establishment of these came, of course, after the war. In Toronto the federal government established a place called TRIT. I think those initials stood for the Training Rehabilitation Institute of Toronto. Its function was to enable returning veterans to obtain the various kinds of education they wanted. I know many people went there to complete grade 13 so that they could go on to university, and many went to get rather "instant" trade training. It was very, very good.

Out of TRIT in 1948 evolved the Ryerson Institute of Technology and the Provincial Institute of Trades in Toronto. These weren't quite the first, because the first Institute, and I'm always reminded of this, was the Haileybury Institute of Mines in Haileybury which began in 1942. That's up in my neck of the woods, and I can never forget it. But actually, the starting of Ryerson and the Provincial Institute of Trades were the two biggest events in Ontario in terms of establishing this level of education.

This situation was rather static for a while and then all of a sudden there was a burst of activity. The Provincial Institute of Trades evolved or developed three institutes of trades in various parts of Toronto which became the nucleus of George Brown College. In the Institutes of Technology era there was a spurt in 1958 when the Hamilton Institute of Textiles was expanded into an Institute of Technology. A new and instant Institute of Technology was established in Ottawa in 1960, the Western Ontario Institute of Technology was established in Windsor, and in 1962 the Northern Ontario Institute of Technology was established.

One other event that occurred in that period of time was the establishment of the Lakehead Institute of Technology - I think the date was around 1954 - and out of that emerged Lakehead University at Port Arthur and Fort William, now called Thunder Bay.

On the other side, the vocational centres were also to be expanded, and there were centres planned for Ottawa, London and Sault Ste Marie. These came into existence in 1963 for Ottawa and London, and in 1965 for Sault Ste Marie.

In 1965 the legislation was passed establishing the Colleges of Applied Arts and Technology and, as I said, the press really publicized these as the "instant" colleges. Of course, there were instant colleges - the first two were Lambton College here, which began operating in 1966, and Centennial College. The big year was 1967 when most of the other colleges emerged, many of them instant colleges starting with nothing, the others building on the base of the Institutes of Technology and vocational centres. In the legislation, these Institutes of Technology and vocational centres were absorbed by the colleges. The concept of the colleges was to build on that base and expand and broaden the spectrum.

In Ontario, the philosophy for community colleges is different from elsewhere in the sense that it is very specifically occupationally oriented - that is, the goal for our colleges is not university transfer programs, but to provide educational opportunities for the whole spectrum from the functionally illiterate to the very sophisticated post-secondary three-year programs beyond grade 12 in business and in applied arts or technology.

The legislation also allows decentralization. The intention was to have the best of both possible worlds - that is, the independence of being governed by a local community board of governors, and some sort of direction and centralized philosophy which was embedded in the legislation. It has worked very, very well.

One of the things that it is sometimes difficult to understand in Ontario is that all of our colleges are Crown Corporations and therefore have certain restraints and certain freedoms. One of the greatest freedoms, and I hope no one from the Department of Public Works is here, is that construction was taken out from under the umbrella of this Department. This is really what enabled us to build instant colleges - I say that a little bit in jest.

The flexibility we have in Ontario is illustrated by this publication which is published by the Ministry of Colleges and Universities, called Colleges of Applied Arts and Technology Programs 1972-73, CAAT Chart No. 6. There are six pages of programs that are available in the twenty colleges. All twenty colleges don't offer all the programs, but there are six pages of programs and they are all vocationally-oriented. In addition to that, the Ontario colleges have the responsibility for administering the Federal retraining program, working with isolated Indian groups, working with, as I said before, the functionally illiterate, and so on.

Any person in Ontario who is 19 years or older who comes to the college and wants to take a program that he has prepared for can do so, and we can give him academic upgrading to give him the background to enter one of our post-secondary programs if he lacks it.

Coming now to Cambrian College, just to give you an idea of how we were established, the Board was first appointed in 1966 and Cambrian was established to serve the population of the districts of Nipissing, Sudbury, Manitoulin, and Algoma. The two most extreme towns are Mattawa, on the east, and Wawa on the west and north. The distance between those points is of the order of 400 - 450 miles, and the population within the territory is 350 - 400,000 people. Fortunately, it is very definitely concentrated in three major centres, North Bay, Sudbury and Sault Ste Marie, and it was obvious to the board and to myself as President when we were established that if we were going to serve the needs of these people in the community at large we would have to establish colleges in each of these communities, which we did. Our administrative approach has been very decentralized, treating each campus within our college as sort of an independent college. We have now developed to the point where I think it is necessary for us to break into three separate colleges, and I anticipate an official announcement to that effect within the month, if not sooner. I think my time is up. Thank you.

FOURNIER

Thank you, John. And now Dr Eastman will tell us about Alberta and the college at Red Deer.

EASTMAN

First of all I'd like to mention that Red Deer is situated in the heart of Alberta, midway between Edmonton and

Calgary. We like to say that we have something like 85 percent of the population of Alberta within commuting distance of Red Deer, and it's probably true, I think over a million people, but most of these of course are located in Edmonton and Calgary. Our community has a population of roughly 28 - 30,000 which I gather is about half the size of Sarnia.

The College itself is a public college, one of six in the system which is set up under a Colleges Act. This is somewhat simpler than the Universities Act, although the general structure of the system is patterned after the university system and both the college and university systems come under the Department of Advanced Education of the Government of Alberta. In this respect I understand we are similar to Ontario. The colleges have autonomous boards of governors that do have a reporting relationship, primarily financial, to the Colleges Commission, and the Colleges Commission apparently reports by some not too well defined process to the Lieutenant Governor in Council through the Ministry of Advanced Education.

The Colleges Commission is composed of nine people who are Government appointees. Three that are members by statute are the Deputy Ministers of Advanced Education and Agriculture, and the Deputy Provincial Treasurer. Five other members are selected from the general public through nominations which are solicited publicly and by some process narrowed down to the five people required to fill the positions. Then there is a permanent chairman who really has a position somewhat like a civil servant and is analogous to a Deputy Minister. The chairman is also the head of the administrative staff of the Commission. The Commission sets general policies and a philosophical framework or statement of purpose, I suppose you might say, defining what the role of the colleges ought to be.

This role is generally getting to be rather comprehensive. We offer university transfer training - at Red Deer

College we offer the first two years of university in about twenty major fields. Then in addition to that we are vocationally-oriented, providing training for the employment market, and we are supposed to play an extremely important role in continuing education, retraining and in community service and Outreach programs of various kinds.

We have some rather clear-cut functions which we have reduced to writing and these are generally as follows. We intend that the colleges ought to broaden the base of education in Alberta. We intend that they ought to ease the problems of access, distribute students according to their abilities, and provide a salvage function, or a second opportunity to go through the academic stream. We intend to assist students to adjust their aspirations to their abilities, and of course we intend to distribute college facilities throughout the country and provide a geographical access. More specifically, this comes down to university transfer, vocational education, adult upgrading and continuing education, the kinds of things I have already mentioned to you.

Since this is a conference on accountability, I thought I would go through some of these functions and see how well we have done. This will be a little departure from what the other people have done, but I am always in the position of having to follow somebody else when it seems like everything has been said. Mind you that never deters me from speaking at some length!

We have an open door policy but not with respect to a particular program, only to the college.

We say that we want to broaden the base of education, and yet at Red Deer College we had probably 80 percent of our enrolments during the past year in the university transfer program. What this does to our vocational areas I'll leave you to judge for yourself.

We talk about access. Geographically, yes - we provide rather easy access within commuting distance of a large segment of our population. But the financial access is another consideration that we seldom report on in our calendars. What about the access to people of various social and economic strata and minority groups? I mention minority groups because we have minority groups in Alberta; we've got a lot of native Canadians on reservations and by and large the educational processes of the Province have passed these people by completely.

We talk about distributing students according to their ability, and we certainly do a certain amount of testing and counselling and remediation work, but as we heard from one of our earlier speakers today, Dr Roueche, I leave it to you to decide just how effective all of that is.

We talked about a salvage function but the attrition rate makes you wonder as to what kind of a salvage job we are doing. We think we are doing very well if we have an attrition rate of only something like 20 percent, but 20 percent is an awful lot of people when we're talking about a small college.

I'm afraid we don't do too well when measured against the accountability of delivering on those things which are supposed to be our stated purposes.

Again we tout certain kinds of advantages. We say come to Red Deer College because the classes are usually smaller. Recently we've had some difficulties financing, so when that happens, you start to reduce the staff and increase classes and right now we find that many of our classes are just about the same size as those at a university.

We say that we have a definite and comprehensive plan for the individual student, that we are a student-oriented college, that we are concerned about a person - we don't teach classes, we teach people, and this kind of stuff - and yet our counselling staff is now composed of one full-time counsellor and one part-time counsellor who serve 1,600 students registered at the College.

We talk about an active Students Association to provide certain leadership potential for our students and provide them with recreational and social activities and planning and organization - perhaps this is one area where the students deliver for themselves.

We talk about facing the problem of student adjustment, particularly for those students that are going on into another institution such as those who are going to university transfer programs. Now that's most of our students, who don't want to go directly into a multi-versity, 18 or 20,000 students at the University of Alberta or 10,000 at Calgary, but who want to take an intermediate step. We talk about these students coming in and having an easier introduction; then, when they do arrive at Red Deer College, they are faced with all kinds of bureaucratic routines - impersonality, registration is done on a computer - and they become a number. We have demands for refunds because their complaints are not heard and people are not sympathetic, etc. Again, our score is kind of low when we account for this sort of thing.

Some of you may have heard that we have had a little unrest so I thought I might just share with you, for your interest if not for your benefit, some of the issues which in the past have been rather academic to me but which become very pragmatic and down to earth when people and groups focus on them.

Just briefly, goals, purposes of the college. We are having a heck of a debate right now as to what our college is to be. There are probably 85 percent of the faculty who feel that it is a university in the making. This runs contrary to Commission guidelines, and also to the college board's policy, and so we have a very serious problem defining which way Red Deer College is to go.

When it comes to ordering those particular goals in terms of priority, we have problems with college legislation. There are important parts of our Colleges Act which are quite unclear. For example, what are the powers and duties of the college board? They are autonomous boards, but do they have sole authority to hire and fire people or must they share this responsibility with the academic staff? We were faced with a Supreme Court suit at Christmas-time in an attempt to clarify this.

We've had problems with organizational structure, having been told by a Commission Inquiry into the college that the organization is too fat administratively. This in view of the fact that we have the leanest administration in the entire system.

We have problems knowing whether the formal structure really is ideally suited to the purposes of the college - does it accomplish the kinds of things that it is supposed to? In other words, is it particularly academically oriented or supportive, or is it one of those kinds of bureaucratic creatures that grows up to serve its own ends?

We have problems with the processes within the organization, the old buzz word, communications. How can it be improved? Where are there blockages? We talked about the conflicts that arise because goals are not the same and/or are not communicated in a way that people understand them to be the same.

We have problems of the individual personalities and idiosyncracies which arise when you put people together in an organization and try to make it work.

We have all these sorts of problems and we have problems just defining what the roles of the different people are. There are some who say the President is all-powerful, too powerful, he controls the Board. This is a real surprise to me because I always though that I was the one guy who had no power at all. You find out about these things.

We have problems about who is supposed to make appointments to positions. The duties of the President are very clearly specified, both in law and in board policies, but when the President acted to perform those duties he was criticized for extending his power.

We have problems defining what ought to be in a collective agreement. The law says that we should negotiate terms and conditions but nobody seems to know what terms and conditions are.

We have problems with evaluation and accountability. The academic staff are very desirous of making the Board of Governors responsive to them - not only responsive but accountable. The students of course have gone along with this, so we kind of wonder who is evaluating who and how it should be done. What are going to be the criteria? What are the standards for each criterion, and how are the measurements to be taken and then compared?

I thought that some of these things might be of interest. Thank you.

FOURNIER

Our thanks to all of you.

THE U.S. COLLEGE SCENE
A PANEL DISCUSSION

Dr. Roger Yarrington, American Association of Junior Colleges

Dr. Donald Puyear, President, Virginia Highlands Community College, Abingdon, Virginia

Dr. Donald Carlyon, President, Delta College, University Center, Michigan

Dr. Derek N. Nunney, Vice-President for Academic Affairs, Oakland Community College, Bloomfield Hills, Michigan

YARRINGTON

Ladies and Gentlemen: We are going to hear this morning from three gentlemen representing three different colleges in the United States, two from Michigan and one from Virginia. They are all fairly new colleges; Don Carlyon's college, Delta, opened in 1961, and the other two are newer than that. We will start with Don Puyear, who is President of Virginia Highlands Community College in Abingdon, Virginia. Don . . .

PUYEAR

Thank you Roger. This is a story of the establishment and early operation of a comprehensive community college in the rural mountainous region of south-western Virginia.

In many ways there is little remarkable about this story for it is being repeated, with some variations, 23 times in Virginia alone. And, yet, in another way it is a unique story of a unique institution developed to serve the particular needs of a particular region. From the beginning we have been concerned with examining the College's role in its community, establishing goals and evaluating how well these goals have been met with respect to specific criteria established at the time the goals were decided upon. This, then is the pragmatics of accountability.

Virginia Highlands Community College was established in 1967 by the State Board for Community Colleges. Virginia has a system of community colleges, each of which is a state institution. Virginia Highlands' development came at about the mid-point of the initial development of the system. The college serves a region which includes the City of Bristol, Washington County, and the western portion of Smyth County - a total area of about 1200 square miles and a population of about 71,000. The region contained a vocational-technical school with post-high school offerings. These post-high school programs provided the nucleus for the occupational programs of the College. In 1970-71 the college first began operating as a comprehensive community college. It had 567 students and 15 programs. Ten of the fifteen programs were occupational - the remaining five university-parallel. There was a professional faculty of 32 members and an operating budget of just under $700,000.

Local needs have been assessed on the basis of data supplied by various state and federal agencies and, most importantly, from the citizens of the locality. There is a Local Board which has some considerable authority with respect to the establishment of curriculums and other college operations. There have been numerous ad hoc and standing advisory committees. These committees are actively involved with the college faculty and administration in the ongoing evaluation of the college's role.

It would be impossible to even touch upon each activity of the college. Instead, I would like to very briefly describe three different activities relating to the college's response to the community and to the question of accountability.

Developmental Education:

Among the assigned responsibilities of a comprehensive community college in Virginia is that of providing

Developmental Education opportunities for students who are not fully prepared to enter one of the regular programs. The traditional response to this need has been the provision of special developmental courses. Often these are speeded-up high school courses - perhaps using programmed materials or other auto-tutorial devices. This approach has been shown to be particularly ineffective by several different researchers. We determined that we would attempt to find a better approach. After considerable study and consultation with various consultants, we devised a rather simple technique which seems to work in our case. Essentially it amounts to adding a variable length laboratory to the regular introductory courses in English and mathematics. Those students with deficiencies take the additional laboratory in place of some other course in their program. The laboratory experience is tailored to meet the individual's need and makes use of individualized instruction, tutoring, or special projects as assigned by the instructor.

In this case the need was first identified by the college administration before the faculty was hired. The primary assistance in the development of the program came from our local public school educators and from our colleagues from within the Virginia Community College System. The instructors who were to implement the program developed much of the actual technique and are, of course, the individuals primarily responsible for its effectiveness. This program was reported in the ERIC Topical Paper No. 31, After the Open Door: An Approach to Developmental Education, which was published in March, 1972. This paper describes the process in more detail and gives some preliminary results of the first year's operation.

The Saltville Job Preparedness Center:

The Job Preparedness Center in Saltville is a totally different type of program developed in response to a unique community need.

The Olin Plant at Saltville, Virginia, was an early casualty in the war on pollution. Enforcement of more stringent water pollution standards forced the closing of this plant, which was the only major industry in this town of about 2400 people. Over 600 jobs were eliminated almost overnight. The loss of this type of industry is an inconvenience at any time or place but in a town that has basically been a "company town" since the 19th Century, it promised to be a tragedy. This town was within the college's service region. What could the college do?

First, we had to find out what the situation was. The company and the town officials cooperated magnificently. But the news was worse than we feared. Since this was a "company town operation" and since the production workers required little formal education, the pattern had long been established of the young men quitting school as soon as they reached legal age for employment and going to work at the plant. The analysis showed that almost 80 percent of the workers had less than a high school education and more than half had completed no more than the 8th grade. Further, it became apparent that most of these workers had roots deep in the area and were not willing or able to relocate. While some had skills that could be transferred to other jobs - many did not.

Second, the college officials sought out the advice of knowledgeable individuals both within the region and from without. A sociologist at the College of William and Mary had been doing a human geography study in Saltville. He was able to give us some invaluable insights. In this case many of the local individuals were inclined to throw up their hands in despair, but not all.

Third, based on our own studies, knowledge, and the advice of the consultants and advisory committees, a plan of operation was developed. This included the establishment of an adult learning centre where the individual workers could develop their skills in basic communications and basic mathematics. As specific jobs or job types were identified, training for these jobs would be presented. When new industry could be located within the region, training would be provided to prepare these former Olin employees for the new jobs. In addition to direct training, individual and group counselling were to be made available through the college and through such agencies as the Virginia Employment Commission. Specific criteria by which the success of the program was to be evaluated were written into the original plan.

It is important to note that as this plan was developed numerous other state and federal agencies were contacted. Such agencies as the Virginia Employment Commission, the Division of Industrial Development, the Public School Systems, and particularly the Manpower Development Training Skills Center (which is also located in Abingdon) all had services which were applicable to this situation. The program of the college was carefully coordinated to complement rather than duplicate these efforts. Also the program at the Job Preparedness Center was carefully constructed so as to allow the citizens of the Saltville area to develop their own program and do for themselves rather than some outside agency, such as the college, coming in and doing for them. The Town Council took an important leadership role here and much of the success of the program is due to this leadership.

This program has been in progress for about one year. No major new industry has yet come to Saltville but efforts are continuing. To date 41 individuals have received high school equivalency diplomas as a result of their work at the adult learning center; over 150 individuals have received or are receiving job training in such areas as blueprint reading, welding, and electricity; and approximately 60 individuals have been placed in jobs, at least in part, as a result of their involvement at the Job Preparedness Center.

Perhaps the most important result of the Center was psychological. An agency came to this town offering specific tangible assistance at a time when everything seemed to be falling apart. The people responded. They took this opportunity and they have demonstrated in a number of rather dramatic ways that Saltville will not die - it will change - it will adapt - but it will not die.

The plight of Saltville has been reported in a number of magazine and newspaper articles. Perhaps you will recall the spread of Life magazine about 18 months ago. It was very kind but not too hopeful. In contrast the March 13 issue of Chemical and Engineering News carried a cover story on what the town is doing to come back from this blow. It is a very fine article and, since it is very complimentary to Virginia Highlands Community College, I hope you will seek an opportunity to read it. Also Bill Harper's article in the March 1972 issue of American Education gives a thumbnail sketch of the program.

G.O.A.L.S.:

Virginia Highlands Community College participated as a field-test institution for the G.O.A.L.S. (Goal-Setting for Organizational Accountability: A Leadership Strategy) program developed by the National Laboratory for Higher Education. This program is being reported in greater detail at this Institute. Our involvement with the Laboratory on this project was the result of a happy coincidence. Major George Baker and his colleagues had been working on this program for a number of months before we heard of it. We were working independently on the development of our institutional goals and I was casting about for some advice as to how one could best involve students, faculty, and community in this task. One of our colleagues at the University of Virginia, who had been assisting us with our in-service training programs, is a member of the Board of

Directors of the National Laboratory. He knew about what George was doing and suggested that I get in touch with him. When we called George he had just finished a first field-test experience and was very agreeable to including us in the second round of field-tests.

Early last fall members of the Virginia Highlands Community College Forum (this includes administrators, faculty, and students) conducted a test of the original edition of the program. It looked very promising so we decided to proceed. A small number of changes were made to better adapt the instrument to our situation and to remove some bugs that had shown up in the previous tests. The instruments and instructions were then revised and republished for college-wide use early in December of last year. We had nearly a hundred participants in this one-day program - the entire faculty, a good number of students, and members of the local advisory committees. Again, the results were most positive. The direct product of the study was a statement of the group's consensus with respect to such matters as the importance of the various programs, instructional ends, and administrative means. This has been incorporated into the college's new plan of development. Perhaps even more important in the long run, was the dialogue that was begun that day. There has been an openness among the faculty, administration, and students that has been most gratifying and I really don't believe that it was there to this extent before. We have just had our final visit from the Southern Association Accrediting Team. This openness and sense of involvement on the part of all components of the college community was noted prominently in its critique.

There we have a very quick glimpse into a new community college. It is a college that belives in clearly _stating_ what it is supposed to be doing and then _evaluating_ how well it is doing what it is supposed to be doing so that it can _better_ _do_ what it is supposed to be doing. Thank you.

YARRINGTON

Thank you very much, Don. Next we are going to hear from Don Carlyon, who is President of Delta College in Michigan.

CARLYON

I heard a story recently that illustrates a point. A young man, who did not appear to be too bright, walked into a lumber yard and told the clerk, "I want some 1 x 4's". The clerk said, "Are you sure, don't you mean 2 x 4's?" The young man said, "I'm not real sure - let me go out to the car and ask my buddy, he's smarter than I am." He came back in and said, "You're right, I do want 2 x 4's." And the guy behind the counter said, "Fine, how many do you want?" "Well I don't know, I'll go out to the car and ask my buddy, he's smarter than I am". He came back in and said, "I want 160 of them", and the clerk said, "How long do you want them?" "Well, I don't know, I'll go out to the car and ask my buddy, he's smarter than I am". He came back in again and said, "My buddy says we're going to need them a long time, we're building a house! "

My point is, very simply, that sometimes when we look at innovation in community colleges, we tend, instead of building something dynamic that keeps moving, to build a house that's there for a long time. We let the innovation become the new rigidity. We innovate to break away from something that has become rigid, and then we spend much time defending that innovation. It's strange that you never have to defend anything if you continue to just do what you're doing. It doesn't make any difference whether you have an evaluation of it or whether it's doing the job or not. As long as you don't change, you're in good shape. Probably our relationship with our public would be much better if we still sat in the classroom with its four walls and old-style school desks and a chalk-board and a teacher. We wouldn't have to defend anything.

But when you change, you've got to defend it, so when we innovate, we've become so defensive so that pretty soon our main purpose, as we talk about innovation, is simply to defend it and in effect, build in that new rigidity.

Let me tell you a little bit about my institution. The Good Lord only knows how it was created, because it serves three counties that are as diverse in personality as any three you could imagine, even though they are adjacent to each other. Midland County, which is the home base of Dow Chemical, Dow International, and Dow-Corning, was for many years very much a whites-only town, and only within the past five or six years has that begun to change. Saginaw County, which relies very heavily on General Motors for employment, has a large population of blacks and chicanos. Bay County is the third county we serve.

We tend to think of ourselves as being very small and sort of backwoods because we are so far north of Detroit, and yet if we think in terms of the tri-county area we serve as a unity instead of separate entities, we have a major metropolitan area of about 450,000 people.

Our institution is a pretty good size, seventh in the state in enrolment, with about 4,500 day students, another 1700 evening students, and another 1700-1800 students in community service programs.

Let me tell you about three things that we are doing. I will refer to them rather quickly because you may want to ask questions.

One thing that perhaps many of you have heard about is our single-concept films, particularly for nursing. These were developed as a result of several circumstances in our past, not the least of which was contact several years ago with Sam Postlethwait. One of our faculty members in nursing received a grant from the Federal Government and developed single-concept films which are now being produced by Prentice-Hall and are being sold. So far Delta College has realized something more than $100,000 in royalties from this project. Very helpful. I am not sure how it is in Canada, but in the United States, there was panic when it began to look like the single-concept films we had made were going to be commercially feasible. We asked our Government what they wanted us to do with the profits. They had never been asked, "Do you want the money back?". And they had no idea what to do with it. It took almost four months, including phone calls, letters and personal visits, for them to decide that they didn't know how to handle money coming in this way. So we are using the dollars to produce single-concept films for other areas of the college.

A single-concept film runs in a continuous loop in a cartridge for 1½ to 4 minutes in length. We have now produced around 150 in the nursing area. Each film focuses on a single concept. It might be making a bed; it might be washing a bedpan; it might be removing a suture. The students, when they are at points in the course where films apply, simply go into the audio-tutorial laboratory where they can see the film as many times as they wish. With some there are scripts and with others audio-tapes.

Theoretically, this approach has made it possible for us to handle more students with the same faculty and with the same resources. As a practical matter, it tends to become an enrichment kind of thing, or has with us. This is one of those areas that I referred to that tends to develop a new rigidity.

I would also like to mention the participation of Delta College in the League for Innovation, an organization made up of sixteen community college districts throughout the United States. Sixteen is a relatively small number of districts compared to the over 1200 districts in the U.S. Between us, we represent about one out of every seven or eight students in the United States in community colleges. Obviously, we're one of the smaller of the colleges in the group. Our basic purpose is to work together so that when an innovative concept is developed at our institution, it can then be tried at other colleges to see if it is a valid concept that others can use effectively, or whether it only works at our institution because of circumstances or personnel involved. If it then proves valid, we can distribute the innovation to all the members of the League and to other colleges as well that have an interest.

The final point I'd like to mention is something we are now just beginning, and when I say "just now", I mean just now. It was approved by the Board of Trustees on Tuesday of this week. It's a professional development plan for counsellors.

Generally, for faculty members, there is a possibility of a degree of progress through a career, for instance from instructor to assistant professor to associate professor to professor.

But if you are a counsellor, there is nowhere to go — there is no obvious professional progress possible. Also, a counsellor is some place in limbo in many institutions and in education generally. Are they administration? Well no, of course not. Are they faculty? Well no, they're not that either. Well what are they?

In our case, we believe that a counsellor has a very basic and vital function, especially in a community college, and that there ought to be some opportunity for progress. So our new concept, our new professional development plan, provides for progress through rank in the counselling staff, just as for faculty. There are productivity guides and objectives which must be met in order to make this kind of progress. Many of these are determined by counsellors themselves. Judgments, year by year, will be made within the student services staff.

So for next year, we are beginning a different kind of approach to the way we recognize our counsellors and to the way they work with each other.

I think rather than go any farther, I'll leave it now and answer questions later. Thank you.

YARRINGTON

Thank you, Don. Our next speaker is Derek Nunney, who is Vice-President for Academic Affairs at Oakland Community College, also in Michigan. I thought when I read his background that perhaps he was a native Canadian, but I discover while he went to school here, he is a native of England. Derek is going to talk about developments at Oakland Community College.

NUNNEY

Thank you, Roger. We are a multi-campus district for a million people in the county. We have four campuses, and we are projecting 17,500 students for the fall with about a $15 million budget. The four campuses are distinctly different, each concentrating on different elements of the curriculum.

One of our curriculum areas is applied sciences and arts, which includes the old voc-tech, business, sciences, computer sciences, food services, etc. Then there is the traditional liberal arts curriculum, and finally our third curriculum is a general education curriculum which we established as a non-credit facet of our program.

We operate under a program, planning, evaluation system. At the college, every department writes a mission statement, establishes goals and specifies criteria for evaluation. Our budget is determined for each department on the basis of their program plans, and so the budgeting system does evolve out of the programs. We don't slice the pot up and give each group a certain amount of money. Each department has to write a program plan, state specifically what their performance goals are and on this basis they are funded. This is important in terms of accountability, because if a department - say a math department - states that one of their performance goals is to pass 50 or 60 percent of the students with a passing grade of A, B or C, this means, to us, that they don't need as much money as the department that says they are going to pass 90 percent of their students with a grade of A, B or C. By and large, that's how we challenge the departments. They can establish their own performance goals, but then the budget reflects what they intend to do.

Dr Hill, the president, and myself came into the college about three or four years ago. Oakland has gone through all of the problems, and maybe more than others, that surround the start-up of a college going from zero to 17,000 students in seven years on four campuses with a $34 million building program, and all sorts of hazards with the instructional program. That's the part I really want to talk to you about this morning.

If we run a test on the contents of the last three days, I don't have any doubts in my mind that about one-third of the people in this room would get A's and B's, another third would get C's and D's, and the other third would get F's. A single system approach in education seems to always produce about a third of the students with failing grades, about a third of them getting middle or low grades, and the rest scoring rather well. This is Bloom's point, and McKeachie at the University of Michigan has discussed this in an analysis of ten years of educational research.

So we've simply said that this is not acceptable to us. I remember, as a graduate student, getting paid $1,500 to go and teach 300 students psychology. We did just as well as a professor did for $15,000 - he failed a third of the students and so did we. So we were all equally unsuccessful. Now you have to start saying to youself, "Well why on earth does that exist?". I am sure you have taken courses on measurement and evaluation, where you are specifically taught how to fail students. What we've said, as a group of educators, is that over a period of time we have adopted this normal curve of distribution and over and over the data comes out a third, a third, a third. And as I said, I know very clearly that in this group, that if we were to run a test now, we could predict the distribution of a third, a third, a third. You don't need a lot of money to produce that, so if a department in our college predicts this or projects this as their performance goal, and they want to be accountable for this, we say fine — you'll get a minimal amount of money to do that.

We've said that our goal is that 90 percent of the students - this is a goal, remember - 90 percent of the students will acquire 90 percent of the information the instructor is trying to transmit on 90 percent of the tests.

This is the kind of accountability we're talking about, and we don't demand it of all people. But if a faculty member wants to aim at this goal, the question comes immediately, "How do you produce this kind of learning?".

We know that the lecture-discussion approach produces a normal curve of distribution. As you know, Oakland has used a modification of Postlethwait's audio-tutorial approach. We suspect that with a completely random group of people, the audio-tutorial approach would produce a normal distribution of grades. I used to do a lot of work with programmed instruction. In 1961 we were saying that 90 percent of the people can learn 90 percent of the information using programmed instruction. It didn't work. I believed it, and for four or five years tried it, but essentially we are lucky if we get a third of the people in that top group. If we went to teaching by video-tape - you can go to some schools and get biology or sociology completely on tape - again we find that about a third of the people do extremely well. I could go on - youth-tutor-youth, seminars, single-concept films - you name it. The research shows, according to McKeachie, that no matter what you do, you keep on getting this normal curve of distribution.

Very frustrating to us as educators. We wanted to throw out the lecture-discussion approach, and it was thrown out by a lot of people and replaced by audio-tutorial. It was thrown out by a lot of people and replaced by programmed instruction. As a group of educators, we have tended to throw out each system systematically. I am over-generalizing, but people have switched from system to system to system. So you find school systems where they have bought a tremendous amount of video-tape recording equipment, and it's stored. Or programmed instructional material, and it's stalling. It's not only because people don't understand how to use it, it's because they try to use one system with every person. We've adopted the position that, look, these systems all work. The lecture-discussion is excellent for this third over here. We should keep it and we have kept it in the college. The audio-tutorial system in which a third can do well - we've kept it. You may be in love with seminars, rap sessions and so on, and it's a disaster for you to go into a lecture session and have to sit there, so that we ought to have seminars in there for you.

Essentially, this is what we've done at Oakland. Originally, the college tended to drop the lecture-discussion and went completely audio-tutorial - 6,000 carrels, 6,000 sets of headsets and so on - everybody was supposed to learn through their ears. We know it didn't work for everybody, but we know that it worked for maybe 30 percent of the people. I wouldn't like to be tied down specifically to what the percentage is, but what we're trying to come to is this: we've got to somehow give students what they need to learn best.

This group can go off and stay in a lecture-discussion. This group can go into programmed instruction with a para-professional where you won't need a faculty member. This group is a group of rappers, you like to talk and fight and argue, and we have a guy down here who is tremendous at it and we're going to pay him $1.50 an hour to work with you as a small group. That's what we do - youth-tutor-youth — we pay our students $1.50 an hour to help other students. So we try to burst our students out of a general setting.

In our original experiment on this we took 5 faculty members and 500 students. We later expanded this particular experiment - in social sciences - to 10 faculty members and 1500 students on a controlled experiment. We were running a 64 percent A, B or C; on the experimental design we were running 92 percent A, B or C. We gave the kids a questionnaire to see if they liked it and 96 percent of the students said they preferred the system. Remember, the system is a totality - it includes lectures, discussions, audio-tutorials, programmed instruction, video-tape, youth-tutor-youth seminars, and independent study.

That essentially is the instructional design.

A major problem is how do you get the student into the right system? That's the thing we're calling cognitive-style mapping. Every student coming into the college goes through a three hour battery of tests. We try to determine whether he learns better through his ears or his eyes. Direct measurement and direct questioning. We try to determine whether he is comfortable in a small group session, in a rap session, or if he's more comfortable in an independent, individualized carrel.

You can say to a group of students, "Look, we want you to get over there and work through this program on mitosis; do the next 35 frames, and the test will be on Friday". You send 20 students out randomly, and probably five of them never get to the programmed instruction lab. Five of them get there and go to sleep, and maybe ten of them are OK. We try to determine whether the students have what we call qualitative ethical intelligence - are they dedicated to a set of rules and principles? If we send them to do something, will they do it?

The whole system is described more fully in the material I have handed out, and I have tried to summarize it in a nutshell.

This is what we are trying to do at Oakland - this is our approach to accountability. We feel that if we don't shoot for a 90 percent success rate, we're going to be in trouble. Obviously some students will do better in food services, others in liberal arts, others in general education, and that's another dimension. We have mapped 30,000 students on this three hour battery of tests. Each student also goes through a fifteen week seminar with a counsellor, one hour per week, getting an interpretation of their map and getting an interpretation of their grading on what's happened to them on this system. So we've got the counsellors built in, the instructional system built in, and we've also just gone with a computerized system to help us look more closely at a student and start to decide where the best possible means of success is for him. Thank you.

YARRINGTON

Thank you Derek. Let me take just a moment to say a few things about our Association, which is also a part of the American scene. As some of you know, approximately a year ago our Association, with the help of the Kellogg Foundation, began a year-long study called "Project Focus". This was a study of the two-year college field in the United States to determine how colleges were changing in order to perceive how the Association could serve the colleges or to change to best serve those institutions. What should priorities be; what should services be? That study was directed by Edmund Gleazer who is the Executive Director of the Association. The Kellogg Foundation specified one thing very clearly. They said that they wanted to be sure if they put the money into it that what came out of it would be implemented so they chose the implementer to direct the study. There were also other people involved in the study to give an outsider's point of view with the impartiality that was needed.

That project has been completed and many of you I am sure have received some of the reports. There were three reports derived from the study. One of them, which appeared in the Junior College Journal and in reprint form, was primarily an in-house report to the Association on organization. More recently, the Association has published in monograph form the technical research report, and a report to the general public on the two-year college field in general is now in the process of publication by a commercial publisher, McGraw-Hill. The technical research report will also be published by them in a slightly modified version as a companion piece.

The Board of Directors of the Association were the first to receive the report having to do with organization. They have approved the recommendations of that report in principle last fall, and at the annual meeting of the Association in March at Dallas, a number of constitutional amendments were presented and adopted.

Following that, a follow-up grant from the Kellogg Foundation provided funds in order to implement some of the recommendations and this is pretty much where we now stand in the Association.

The basic outcome of all this has been to formalize some things that have been happening informally for a number of years and to broaden the participation in the Association.

When I began work for AAJC almost ten years ago, it was primarily an Association in which the Presidents of the member institutions participated. Through the years, particularly as we had various projects in fields such as occupational education, student personnel services, faculty preparation, and so on, we found that the work of the Association was involving a good many people from the institutions besides the Presidents. This is necessary in order to get the work done, and highly desirable. Consequently, in recent years, a good many faculty members, counselling and guidance people, administrators other than Presidents, some students, some local trustees, and others have become quite active in the Association. Also, the nature of the work in our country has changed in some degree and others will be becoming quite active. A trend towards state-level development and administration took place during that time, and a new breed of cat called the "State Director" was emerging. Thirty-some states now have an identifiable person of some kind or another in that slot. They are responsible to state-level boards, state-level Bureaus of Education, or various combinations, but they are very definitely state-level persons with coordination and administrative responsibilities whom it was essential to have involved in our work. Also, ten years ago there was a handful of university professors who were giving attention to two-year colleges, preparing administrators and faculty members in their primary work as university professors. In this role, we have something like 200 - 300 such persons. They are not all so deeply engaged as to identify this as their primary role, but they are interested in working to some degree preparing people for two-year college work. So here's another kind of person besides the college President who has become essential to the community college development in the United States.

So the changes that are taking place in our Association are various kinds, but basically the aim is to broaden the participation in the Association in a formal way so that all of these various constituencies will have open to them seats on our Board of Directors and the opportunity to form councils with their colleagues in these various activities. The Association has not changed its basic nature since it is still basically an Association of institutions, but the philosophy that is implemented by the changes is that all of the people in the institutions need to be participants in some degree and in one way or another in the Association if it is going to adequately serve and provide a national leadership of the two-year college field.

I will be the Moderator of a new body which is just getting started and which will be called, after next month when our name changes, the Assembly of the American Association of Community and Junior Colleges. The Assembly will be approximately 100 persons representing all of these clienteles that I have referred to. They will meet once a year to consider one particular topic which each year will be some social issue or problem that relates to two-year colleges. They will work ahead of time on studying some background papers that will be prepared. They will come prepared to discuss the topic in depth and through the meeting we hope to achieve some consensus, present that, along with the background papers, in book form to the public, and then, at that point, start planning the next Assembly.

The Assembly will meet for the first time November 30 to December 2 at a conference centre in rural Virginia. The topic will be "Educational Opportunity for All - An Agenda for National Action". The agenda that's referred to there will be an agenda for state and federal support of our institutions. We will try to write that agenda and present it to the general public for their consideration.

Very quickly, these are some of the things that the Association is doing. Thank you all.

SELF-PROGRAMMED CONTROL: A NEW APPROACH TO LEARNING

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My answer to the question - are Learning Skills Centers an effective educational service station? - is, no, not effective enough!

The basic problem as I see it is that until now Learning Skills Centers have focused primarily on the cognitive aspects of learning and not sufficiently on the affective aspects. Basic learning skills make up only one factor essential for efficient learning. Equally, if not more important, is the student's mental attitude and state of mind.

As I see it there are two major affective factors that must be dealt with. First, there is the student's usually negative attitude toward school. He most often finds schoolwork a chore and what's worse he usually doesn't think much of his learning capabilities. Secondly, there is the fact that most students are also plagued with any number of personal or emotional problems. Love, sex, drugs, parental difficulties, inferiority complexes, etc., are all capable of producing very real interference. If we are truly interested in improving our student's learning abilities, we have to take into account these two most crucial factors.

The project reported herein was performed in part pursuant to a grant from the Office of Education, U.S. Dept. of Health, Education and Welfare. The opinions expressed herein however do not necessarily reflect the position or policy of the Office of Education, and no official endorsement by the Office of Education should be inferred.

This paper was also presented at the AAHE 27th Annual National Conference on Higher Education, March, 1972

BARRIOS..cont'd

I'm sure most of us are aware of this need. I think the main reason something hasn't been done about it heretofore is that we just haven't had any really effective means of dealing with the problem. I'd like to think that this may now no longer be the case. I would like to take advantage of this opportunity to introduce a unique program that I feel goes a long way towards solving this problem. I refer to it as Self-Programmed Control (SPC).

Although this program has now been applied at a number of schools including UCLA, Golden West College and the University of Uppsala, Sweden (all within the past year), its main application has been at East Los Angeles College (ELAC) for the past two and a half years.

The program at ELAC began thanks to a Title III project, to help disadvantaged Mexican-American students. As a result of its initial success here it has been opened to all students as part of a regular 3-unit development study skills course for the past year and a half.

The Two Basic Goals of the Program

The basic goals of the program are 1) to help instill a new positive attitude toward learning, and 2) to provide a student with an effective means for handling personal and emotional problems.

The Three Components of the Program

The program is made up of three basic interacting components: 1) The Self-Programmed Control (SPC) Techniques; 2) Psycho-Cybernetics; and 3) The Shortcut Learning Techniques.

The SPC Techniques

Perhaps the most important of the components is the first -- the SPC Techniques, for it serves the purpose of opening the door, of giving the student some real hope in the possibility of change. I'm sure I don't have to tell you that changing lifelong behavior patterns is not the easiest thing to accomplish. Much of man's behavior is so deeply ingrained that it has become automatic, that is, not that subject to voluntary control. Any remedial or rehabilitative program has to take this into account. The SPC techniques are aimed at eliminating or breaking through this "involuntary" barrier. They are a highly effective systematic means of giving a person greater control over his "involuntary" side (that is, his habits, attitudes, emotions, etc.)

There's no end to the possibilities of SPC. Just about any aspect of his behavior can now more easily be controlled by the student. For instance, he can gain greater control over his ability to react calmly in previously tense situations, e.g., studying, taking exams, giving a talk, socializing, handling everyday pressures. etc. He can also use it to more easily instill new study habits, be able to concentrate better, become better organized, stop procrastinating, break any bad habits, control his temper, express himself more assertively, control his moods, etc., etc.

SPC Explained

The approach is based on the premise that words and thoughts have the ability to produce reflexive or automatic responses. We know that words can act as conditioned stimuli. Pavlov long ago recognized this fact: "Obviously for man, speech provides conditioned stimuli which are just as real as any other stimuli...Speech, on account of the whole preceding life of an adult, is connected up with all the internal and external stimuli which can reach the cortex, signaling all of them and replacing all of them, and therefore it can call forth all those reactions of the organism which are normally determined by the actual stimuli themselves". (Pavlov, 1927)

This, then, is how one gains control over his involuntary behavior. By focusing on the appropriate thought (subvocal speech) sufficiently, one can produce any positive reaction he wishes. This is the basic premise upon which the SPC techniques are based.

One of the first of the SPC techniques introduced to the student is "The Pendulum". It is an especially effective technique because it gives the student immediate concrete proof of this basic premise. Today, to illustrate this point, we shall go through the first stage of this technique.

The first step is to make a nine inch (9") pendulum using a piece of thread and a paper clip. Now, sitting up and with your elbow resting on the arm of the chair, hold the string between your forefinger and thumb and keep your eye on the paper clip (it should be fairly motionless to start). Next, begin programming in the thought that it will start to swing from left to right. That is, expect it to start swinging in this direction. Soon, to your amazement, it will actually begin moving, automatically, in this direction. The reason it is moving is that the thought or expectation of the movement produces an automatic movement of your hand which is then amplified by the pendulum. Tell yourself that it is going to swing even more and watch it as it automatically responds to your thought, to your own command. And as you see it beginning to move now you begin to realize that you can respond, you can gain control over your automatic side and that by focusing on the right thought you will get the right action. You can next change the direction of movement to a circular one by programming in that it will begin to move in a circular direction. Almost immediately you should find the pendulum begin to move in this new direction, again automatically.

The SPC procedures involve going through a series of such steps, each step increasing the probability of a positive response to the next one. Thus, after going through one of these procedures a person finds himself considerably more responsive to the positive thoughts or goals he wishes to program in. And after using the techniques for a time he soon finds that he can program in his positive thoughts effectively without having to first go through the SPC procedure. Thus, these techniques act as a catalyst or bridge showing a person he can, indeed, accomplish just about anything he sets his mind on.

The greater control afforded by these procedures increases the student's self-confidence (expands his self-image) and makes the possibility of positive change really believable. This in turn opens his mind to the other two components of the program: Psycho-Cybernetics and the Shortcut Learning Techniques.

Psycho-Cybernetics

The Psycho-Cybernetics component is aimed at improving the student's ability to deal with personal and emotional problems. Psycho-Cybernetics (Maltz, 1960) is a positive thinking type book that offers the student a general guide to coping with life, providing answers to many questions and solutions to many personal problems plaguing the average student. Thanks to the SPC techniques the student is now more ready to believe in what a book like Psycho-Cybernetics teaches. As a result of SPC he quickly becomes convinced in the power of positive thought,the philosophy espoused by this and other similar books.

Shortcut Learning Techniques

The third component, Shortcut Learning Techniques, allows the student to experience immediate reinforcement of the new positive attitudes toward school he is beginning to program in. It is pointed out to him that the "A" student is often so, not necessarily because he was born with an oversized brain, but because through trial and error he has acquired many of the shortcuts or more efficient ways of learning, techniques which the student can now learn directly. The point that such methods do make learning more efficient and easier is quickly impressed upon the student the very first session, when he is shown how, by using certain memorization techniques, he can memorize a twenty-five (25) digit number (e.g. 1945200155597541495 2345) in a matter of seconds. The average student who all his life has believed that only "geniuses" could perform such a feat is extremely impressed with his new-found mental powers. Thus, the student's appetite for such shortcut techniques is whetted and he quickly takes to other such procedures offered (e.g. SQ3R for reading improvement, how to take tests. how to take notes etc.). The immediate positive effects resulting from the use of such techniques then reinforce the new positive attitudes being formed. He now finds learning easier and more rewarding and realizes he is capable of so much more than he thought possible. As a result of this change in attitude he is no longer afraid to admit he needs help and he becomes more highly motivated to make up any deficiencies in his basic learning skills (e.g., vocabulary, spelling, grammar, basic math, etc.).

As can be seen there is a positive interaction among all three components of the program, each serving to reinforce the student's new positive attitude towards school as well as towards himself. Now, let us look at some of the results achieved thus far with the SPC program.

RESULTS ACHIEVED THUS FAR WITH SPC

The data to be reported herein was derived from the ELAC Title III project. Both subjective and objective indices have been used to measure the program's effectiveness.

All measures appear to indicate a clear-cut positive effect.

To give you some idea of this effect we will first look at the results of two recent classes, a spring '71 mid-semester class, N = 82, and full-semester class, N = 55 (approximately 9 and 18 weeks of instruction, respectively).

First, with regard to the goal of improving a student's attitude toward school -- the average percentile score on the Brown Holtzman Survey of Study Habits and Attitudes for the mid-semester class was found to go from 19.8 to 47.2, a rise of almost 250%. For the full-semester class the change was even greater, 15.3 to 53.0.

With regard to the second goal, improving a student's ability to cope with personal or emotional problems -- the average percentile scores on the Willoughby test (a measure of inability to cope with problems) for the mid-semester class was found to drop from 73 to 39. For the full-semester class the improvement was even greater, 72 to 29.

A corresponding increase in grades and units completed accompanied these positive affective changes. For example, for the mid-semester class there was an average rise of 0.25 grade points over the previous semester and the average units completed went up from 9.30 to 12.23 (there is no grade data for the full-semester class as most students in the class were freshmen with no previous records for comparison). The grades for the SPC course itself were not included when comparing the two semesters as this might have inflated the difference since I tend to give many high grades. (I do not believe in grading on the curve as I feel it tends to produce a "self-fulfilling prophecy" effect. If you expect a certain percentage of students to be failures or so many to be average you are more likely to produce them. If one is more intent on bringing students "up to level" than to "screening students" he is more likely to produce above average students.)

Also of interest, in addition to the above objective indices, are some of the subjective data. This includes both an anonymous questionnaire and student progress reports.[3]

Of special interest in the questionnaire was a question dealing with excesses. The student was asked to indicate which of certain areas he had been excessive in prior to the course and which of these excesses he had been able to curtail. The following figures are for a total of 236 students, 99 from a Fall '70 mid-semester class and 137 from the two Spring '71 classes:

	# Excessive prior to course	# Eliminating excess after course	% Eliminating excess
Food	90	65	72%
Cigarettes	53	37	70%
Alcohol	53	48	91%
TV	102	84	82%
Marijuana	32	22	69%
Pills ("Uppers" and "Downers")	12	10	83%
LSD	7	7	100%
HEROIN	1	1	100%
Gambling	12	9	75%

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The interesting thing about this curtailment of excesses is that it occurred primarily as a side benefit of the program. No concentrated attack was made on the excesses. It is felt that the curtailment occurred primarily because of three factors: 1) the general increase in ability to relax;

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[3] It was made very clear to the students that their grade in the course would not be affected at all by their performance on any of these objectives or subjective indices.

2) the greater enjoyment of other areas of life; and 3) the greater amount of self-control.

As part of the program, each student was asked to keep a progress report. Following is a sample of such reports. Included with each report is the student's Brown-Holtzman and Willoughby percentiles before and after. It should be kept in mind that these reports are typical and not the exceptional ones.

B.,M. BH 23-50; W 99.9-89

4/12/71 Before applying the techniques, I have been getting 28 or 29 out of 40 on a Psych.I test and after I got 37 out of 40 on a test. I have read five chapters in Psycho-Cybernetics; I don't think I could have done it so soon without SPC. I used the SQ3R method in studying for a test in Health 10, found it effective.

4/26/71 I found that I could talk to people easier when I went out last Saturday and therefore I had more fun. I enjoyed studying for a history test more than ever before. I also used a shortcut relaxation technique before the test -- got an "A" on it.

4/28/71 I am beginning to use the techniques to program in goals on a daily basis.

5/3/71 I used to be very depressed most of the time; now I program in that I'm going to be happy every day and it's becoming a habit. I feel so much better and I find myself accomplishing much more.

5/5/71 Last Monday I started a diet and I have not gone away from it even once, and before it was very hard for me to keep a diet. I program in the thought that I'll keep the diet by using the negative-positive response or just by using the shortcut relaxation technique daily.

5/10/71 I used the flash cards method to study for the vocabulary quiz in this class and got 93% correct. I feel that I'm losing some of my inhibitions; I program in every night that I'm going to be happy the next day and most of the time I am. I'm also beginning to live in the present, not in the future or in the past as I used to do. I used to be very afraid when I thought about the future, but now I'm realizing that the future is what you make of it. I still have so many goals to work toward, but somehow I know I'm going to make it.

5/12/71 I used the SQ3R method to study for a Psych I test and I got an "A" on the test. I feel more ambitious now and much more enthusiastic about life, and I feel I'm going to accomplish everything I set my mind to, whereas before I was getting to the point where I didn't see any purpose in life. I felt as though everything was coming down on me.

G.,R. BH .5-37; W 38-17

1st Week I didn't think this class would help me very much.

2nd Week The technique didn't work for me, and I was going to give up.

3rd Week I tried and the technique started to work. I've started to get interested in the course and my other classes. I've been reading the Psycho-Cybernetics and Vocabulary books and now like the class. I started getting better grades and everything seems to be working out pretty good for me.

4th Week I know now that I can do anything if I apply myself to it. I started achieving some of my goals and will achieve all of my goals by the time this course is over.

5th Week All my classes now seem easier for me, and I now have more time for other things to do. People are friendlier and I feel very gregarious. I don't procrastinate anymore and I turn in my assignments on time.

J.,L. BH 4-40; W 97-52

4/12/71 Since the very first class meetings that we've tried the different techniques, I've noticed an inner good feeling within me.

4/14/71 Got results from my midterms and was very happy to have gotten all "A's" and "B's". I feel I'm really having confidence in what I do and how I feel about myself.

4/19/71 My study habits have improved. The SQ3R technique has helped with my reading. I get a lot more out of reading. I especially like the association technique. It has helped tremendously with the vocabulary words from 30 days to a More Powerful Vocabulary. It makes the whole process of learning new words fun.

4/21/71 The worst time of day for me was about from 2:00 - 6:00 p.m. Usually I felt tired and not willing to get to my school work during this time. Now I can easily program myself to get with it at this time of day. Instead of having a tired feeling, I feel alert and willing to get down and do my school work.

4/26/71 I had to give an oral speech recently in one of my classes. I was nervous about the whole thing. However, I programmed myself into not being so, and I was amazed on how well I did.

I find I really have confidence in what I do. Before when I had an important decision to make, I always asked relatives and friends on what I should do. I worried constantly on any decision I had to make. I now make decisions without worrying or relying on others to tell me what's right or not. I feel much more independent.

5/3/71 I always felt my boss was so superior that I felt nervous when talking to her. I tried the negative-positive technique, and I was able to carry a good conversation without feeling inferior.

R.,G.   BH 26-70; W 72-38

1st Week I came into the class kind of a disbeliever but after playing around with the Pendulum technique, I started to believe in it.

2nd Week No progress to date with homework. I have noted some improvement in my self-confidence when I'm around my girlfriend.

3rd Week Still no progress in my homework, but I'm still trying.

4th Week Started Relaxation technique. I still prefer the Pendulum technique, a little progress in doing my homework.

5th Week Got a 96 on my Trig. test, highest I have yet received in any of my math classes.

6th Week Got a 93 on my Chemistry test. I am now starting to do my homework regularly.

S.,J.   BH 28-66.6; W 83-12

4/12/71 Greater relaxation. More at ease with people. Greater enjoyment of school and work. Sleep better at night. Less use of drugs and alcohol. More positive outlook, self-assurance. Still procrastinate on assignments.

4/19/71 Improvements becoming habits. Studying actually is more fun. It is getting increasingly easier to make speeches in my speech class; I used to dread writing essays for English I, now I'm consistently doing "A" work.

4/26/71 Use of SQ3R on history lessons and having amazing recall. I have finished Psycho-Cybernetics and I found it fascinating. I plan to read it again.

5/3/71 Progress coming right along; have found that the cold war between my parents and I is starting to taper.

Incorporating the SPC Program Into a School's Curriculum

There are a number of means available which can be used to facilitate incorporation of the SPC program into a school's curriculum. This includes: the SPC manual and the recording of the SPC techniques; detailed outlines for a full semester (54 hours), mid-semester (28 hours) and a condensed (12 hours) course; a video tape and/or film of a four-session (8 hours) condensation of the program; as well as an instructors' workshop.

With regard to the instructors' workshop, its aim is not only to instruct in the ways of teaching the SPC program but also to allow instructors to benefit from the program themselves. No one is perfect and we can all certainly use something that gives us greater control over our lives. This in turn will make us better teachers, more positive in our attitudes towards a student's abilities and much less burdened by our own personal inadequacies. In addition, one becomes a more effective teacher of SPC if he himself has experienced its benefits.

It is recommended that, if possible, the program be offered as, or incorporated into a regular credit class. This provides the necessary external motivation to insure that the student initially practices the method sufficiently to make it work. Also, the student should not be forced to take the course. An introductory explanation of how it works and what it can do plus a brief demonstration of the techniques should be sufficient to get an initial group interested enough to try it. After this, word of mouth should do the rest.

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PARTICIPATIVE GOAL-SETTING IN THE COMMUNITY COLLEGE: A SYNTHESIS OF INDIVIDUAL AND INSTITUTIONAL PURPOSE

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INTRODUCTION

Revolutionary change seems to be the hallmark of the seventies. Many authors have commented upon the nature of our turbulent times. Alvin Toffler's best seller Future Shock described "the dizzying disorientation brought on by the premature arrival of the future". (Toffler, 1970, p. 13). Although Toffler saw education changing rapidly, he viewed much of that change as "no more than an attempt to refine the existent machinery, making it more efficient in the pursuit of obsolete goals". (Toffler, 1970, p. 39).

Bennis, in his book The Temporary Society, expressed the opinion that we too often strive for efficiency and effectiveness within a narrowly defined range of familiar acts. He noted that "the martinet general whose beautifully disciplined fighting machine is wiped out by guerrillas will probably still lay claim to efficiency, but we need not agree with his assumption that efficiency consists of doing an irrelevant thing well" (Bennis, 1969, p. 10). It could be added that an educational structure might effectively achieve its internal goals but still be considered inefficient in terms of meeting the educational needs of society.

If education is ever to reform in a time of chronic and bewildering change, it must begin to view the task of defining relevant goals and achieving a consensus of goal priorities as a primary function of educational leadership. Goal setting, operationalized through participation, can become a primary means for "transforming human purpose into communicable forms for the direction of organizations" (Hack, Briner, Knezevich, Lonsdale, Ohm, Srouse, 1971, pp. 99-100).

New organizational patterns emerging in a growing body of literature emphasize the need to equate power equalization, and individual growth along with task performance. Bennis views participative institutional forms not as vague ideals, but as functional necessities in a society where creative enterprise must be nourished to insure survival (Bennis, 1969, pp. 2-17). Today's administrative structure must be appropriate for a world where complex organizations require expertise in many fields, thus making bureaucratic administrative control from the top ineffective. It must meet today's growing demand for creative, self-directed, educational professionals who are capable of solving problems in a bewildering climate of change, rather than simply conforming to yesterday's routine status quo.

A 1971 blue ribbon panel in its First Report of the Assembly on University Goals and Governance stressed the theme that educational reform could be stimulated through "governance by delegation and accountability" (Hack et al, 1971, p. 190). The rapidly expanding costs and complexity of education in a time of challenging social needs have led to increasing demands for accountability. The premise that those who operate public educational institutions have an obligation to account for educational results would probably not be seriously challenged by many people. Disagreement is more likely to be rooted in the issue of putting accountability into practice. Who is to be accountable, for what and to whom, under what conditions?

Accountability is intimately related to organizational purpose because it aims squarely at results. Since purpose can only be achieved through the people in an organization, accountability cannot really be divorced from leadership. We believe that accountability for the community college should be viewed in terms of achieving learning that meets the needs of both students and society. Individual colleges can begin the process of putting the philosophy of accountability into practice by allowing concerned individuals to participate in setting goals tailored to meet the unique needs of the students and the community in light of the resources available. That participative goal setting process can enable a board of trustees to adopt goals for which participants have indicated a willingness to be held accountable.

The focus for change at a community college is vested with the president. Accountability should begin with him. As educational leader, he is held accountable for overall institutional purpose by his board of trustees. The president can point his institution in the direction of student learning, but human motivation must be harnessed to move it forward. This can be done through participative planning within a team oriented climate of leadership that allows all members to see themselves as accountable and united by their individual contributions to the common goals of the college. We believe the primary function of educational leadership to be that of providing direction. We view educational leadership in terms of an organizational climate that involves people in defining and achieving organizational purpose. It is, after all, people who enable a community college to become accountable.

Today, we want to tell you about a National Laboratory for Higher Education product that can help translate the philosophy of accountability into practice. It is called Goal-Setting for Organizational Accountability: A Leadership Strategy (GOALS for short). It provides a realistic, field tested strategy for integrating the people and the purpose of community colleges.

The development of the GOALS product was accomplished in two steps. First came the process of classifying appropriate goal statements. Then a strategy was devised to achieve goal consensus and set goal priorities.

CLASSIFYING GOALS

An analysis of the community college environment allows us to classify three kinds of goals.

1. Overall Purpose or Program Goals
2. Instructional Ends Goals
3. Management Support Goals

The Overall Purpose Goals link the outputs of the college to the state systems. The Instructional Ends Goals define the desired outputs of the college. The Management Support Goals provide the support necessary to achieve Instructional Goals.

Overall Purpose Goals. The nature of the community college mission as it varies from state to state, dictates the development of overall goal statements that meet the needs of various state systems. The following North Carolina state programs for community colleges are typical overall purpose goals:

1. Operating A College Transfer Program
2. Operating two-year degree technical programs
3. Operating one or two year vocational programs
4. Operating an adult education program
5. Operating a community services program
6. Operating a continuing education program

Instructional Ends Goals. The two-year college is primarily a teaching institution. Therefore, instructional ends are the desired outputs of the community college. The following statements are typical instructional ends goals:

- Increasing basic skills
- Raising the level of vocational achievement
- Raising the level of educational achievement
- Increasing problem solving ability
- Improving critical thinking ability
- Improving self concept.

BAKER-BROWNELL..cont'd

Management Support Goals. Management support goals are statements of desired administrative ends that meet the challenges of the academic and social environments. These challenges must also be qualified in terms of desired results. Academic, social, and environmental goals such as those listed below were developed to show the need for increasing the quality and quantity of student learning:

ACADEMIC ENVIRONMENT

- Reducing student attrition
- Eliminating failing grades
- Providing individualized courses

SOCIAL ENVIRONMENT

- Actively recruiting the poor and disadvantaged
- Insuring that lack of personal financial resources do not provide a barrier to qualified students
- Increasing faculty and student involvement in the community

These kinds of management support goals require an administrative environment with specific administrative goals such as the following:

ADMINISTRATIVE ENVIRONMENT

Hiring personnel dedicated to student learning
Planning for long-range development
Allocating funds in accordance with priorities to meet established goals
Evaluating the progress of the college toward stated goals.

Management support goals include statements of desired academic ends, social ends, and the administrative ends necessary to achieve them. Together they provide the focus and support necessary to achieve instructional ends and thus accomplish the overall purposes and mission of the college.

A STRATEGY FOR ACHIEVING CONSENSUS

Classifications of goal statements, such as those we have discussed, are not difficult to develop. The real problem is devising a strategy for achieving consensus on goal statements and priorities.

The strategy used in the NLHE GOALS product involves the participation of a representative sampling of the entire college community. Ideally, the board of trustees, the faculty members and administrators, as well as stratified random samplings of the student body and the citizens of the community should participate. The participative goal setting process takes place in a workshop setting and lasts about five hours.

Participants rank order goals in three stages. The first Individual Sort represents initial individual judgements of goal priorities. This is followed by a Group Sort in which heterogeneous teams of four members each (student, teacher, administrator, citizen) reach group consensus in rank ordering goals. The negotiations necessary to achieve consensus require open communication between persons with differing orientations about the purposes of the college. Finally, participants rank order goals for the last time in the Second Individual Sort.

First Individual Sort. The GOALS Display Board is divided into three areas. The white area at the top is for Overall Purpose or Program Goals. The blue area is for Instructional Ends Goals and the red area is for Management Support Goals.

First, the individual is allowed to determine the relative priority of programs assigned by the state. He is asked to rank order statements of overall purpose from most important to least important. This may be the participants first exposure to participative goal setting.

Next, he is allowed to assign priorities to

Instructional Ends Goals. He is told that the blue area of the board represents the resources available for instructional ends. He is asked to focus on the instructional outcomes desired in relative order of importance. He cannot exceed the parameters on the board. The area available for placing the twenty goal statements as well as the importance of the goals themselves force the participant to make difficult choices.

Finally, the participant is allowed to determine the priority of Management Support Goals within the limits of the board. He then notes the results of his first individual sort on a data sheet provided.

Group Sort. In the second round, participants are grouped heterogenously in teams of four (student, faculty member, administrator, citizen) to represent the various orientations of people within the college community. The team, through open discussion, negotiation, and compromise, develops a team solution to the problem or rank ordering all of the goal statements. Consensus tables show the members when there is sufficient agreement to accept a statement without discussion. Since the team members are dealing with the actual proposed goals of the college, they are expected to express and support their views forthrightly. The resulting open, frank, and candid interchange of viewpoints is an essential step in promoting consensus.

Second Individual Sort. After participating in the team solution, each person finally rank orders the goals again in the Second Individual Sort and notes results on the data sheet. This can be considered a post test. When compared to the First Individual Sort (pretest) the changes that resulted from communication during the team session can be identified.

REPORT

After the workshop is completed the individual data sheets are returned to NLHE for analysis. Pretest and post test data are coded on computer punch cards. The overall consensus of all participants as well as the consensus of each group (students, faculty, administrators, citizens) is determined from the computer print out. The following management information is included in the report:

1. The ranking of each goal statement
2. The degree of consensus achieved for each goal statement
3. The range of opinion for each goal statement
4. The attitude of participants toward the participative goal setting process.

SUMMARY

Today, we have presented a realistic, and validated strategy for integrating the purpose and people of a two-year college. The strategy is more than theoretical because it has been tested in actual community college environments in North Carolina, Texas, Virginia and Florida.

Dr. Max King, President of Brevard Community College at Cocoa, Florida, summarized our thoughts about this product when he said: "We have had seminars on goals before, but they always seemed to end with the frustrating feeling of being open ended. This GOALS product allows the participation of concerned people while still managing to 'close the loop' and achieve consensus on goal statements and priorities."

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PRODUCTS AND PRODUCTIVITY: A PERSPECTIVE ON LEARNING

Dr. J. Wade Gilley
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Presented by: Ronald Allison
Educational Development Officer

Wade Gilley was really looking forward to coming and was sorry he couldn't make it. However I was happy to replace him and it has been a most enjoyable trip so far although I've had to rush a bit. Hopefully I can slow down a bit now.

INTRODUCTION

The College has committed itself to accountability for both learning and instructional relevance. This commitment has grown out of the realization that our educational institutions have been placed in charge of the nation's most precious possession, its people, and to be accountable the college must develop this resource efficiently and effectively. Past practices of controlling the quality of the product through high attrition rates are no longer acceptable. Thus, colleges must now focus on providing appropriate and rewarding learning experiences for all of their students.

As a result of this commitment, the Wytheville Community College faculty have adopted as a long-range goal the improvement of instruction, response and accomplishment on the basis of student evaluation and achievement.

A systems approach to instruction was selected as the method best suited to ensure continuing improvement of the teaching-learning process. An essential element of the program has been in-service training to familiarize the instructional staff with the techniques of clearly defining desired educational outcomes and the various learning strategies now available.

Dr Gilley is now President, J. Sargeant Reynolds Community College, Richmond, Virginia.

This program, designed to provide accountability for optimum student learning, has been evaluated in depth for the past three years on a continuing basis. Positive results in increased student learning and thus increased productivity of the college have been observed through these evaluations. The implementation of the program and the documented results are outlined in this paper.

A systems approach to instruction means a systematic approach to teaching and learning and features specific behavioral objectives and a series of learning activities for each unit of instruction. Specific behavioral objectives define what a learner will be able to demonstrate successfully at the completion of a course or unit. It is a statement of expected measurable change in learner behavior. These objectives are the "road maps" for arriving at a learning-oriented instructional program. Just as a home builder would not begin to develop a home without plans, an instructor cannot expect to develop a successful learning experience without knowing what results are expected.

The following are examples of specific behavioral objectives developed in the College's biology, economics, mathematics and nursing departments:

Biology. Identify the basic units of cell structure and describe the function of each.

Economics. The student will list and describe the five determinants of demand.

Mathematics. Given 25 mathematical computations, the student will correctly solve 20 by using procedures demonstrated in class.

Nursing. Given a sphygmomanometer and a stethoscope, the student will correctly obtain an arterial blood pressure reading.

At our college right now, 97 percent of all the courses are structured in terms of these specific behavioral objectives and associated learning activities.

Learning activities are those activities that are planned for the learner based on those specific changes in behavior desired of the learner at the end of the instructional unit. Learning activities may involve formal lectures, taped lectures, programmed instruction, student tutors, films, film strips, slides, trips to observe particular applications of principles of theory, discussion groups, or outside speakers. In the systems approach to instruction, learning activities are selected and arranged in such sequences as to provide optimum learning experiences. The learning experiences for a specific unit may need revision each time the unit is completed if so indicated by the evaluation of student performance.

DEVELOPING THE PROGRAM

Just as the instructor must be able to design the desired outcomes of courses, provide a series of learning activities and assist the student in achieving the outcomes, the college must be able to define the desired outcomes of instructional improvement programs and provide appropriate learning activities to assist the teaching faculty in achieving them. These faculty learning activities are commonly referred to as in-service training and are essential to any program of faculty development. The college faculty spent the 1968 - 1970 period developing specific behavioral objectives for each unit of instruction as a result of a faculty in-service training program. The faculty and staff of the college quickly recognized that quality instruction is a real need of the college student today. In fact, the top priority objective in the college's institutional objectives, both short- and long-range, has been and still is the accountability for student learning as measured by student response and accomplishment.

We have received assistance from the Junior Community College Division of the National Laboratory for Higher Education in Durham, North Carolina. Expert assistance also has been provided by a number of other national leaders in the community college field. Dr Kenneth Skaggs, Dr James Wattenbarger, Dr Max Raines and Dr John Roueche, have assisted the faculty to develop a clear and more consistent philosophy of the community college, and provided insight into the needs of community college students. Also, Dr Sam Postlethwait, Professor of Biology at Purdue University, was at our place two years ago and gave a three-day in-service training program on his audio-tutorial approach to learning. The latter part of 1969-70, the summer of 1970 and a four-week faculty workshop prior to the 1970 fall session were devoted to developing a systems approach to instruction. In the summers of 1970 and 1971, several individual faculty members contracted for three to five weeks of curriculum development with the emphasis on systematizing parts of one or more courses. In fact, during the past two years, the college has invested more than 300 full-time faculty weeks. This is equivalent to ten instructors full-time for one year.

In addition, by the fall of 1971 the college had committed more than $100,000 to equipment and supplies to implement the instructional reformation project. The funds for supplies and equipment, as well as travel, have been expended on a project basis, with merit in regard to the major objectives of the instructional improvement program being a prime factor in these expenditure commitments.

THE INSTRUCTIONAL PROGRAM

Individual instructors proceeded differently in attempts to integrate the new instructional techniques into the instructional program. For example, some courses have been completely systematized, others completely individualized, while others have individualized key concepts within the overall systematized approach. In the latter case, individualized instructional packages or units have been developed (both audio-tutorial and workbook style) and unit mastery is insisted upon for each student.

One instructional group which has completely individualized courses and incorporated many other techniques to help the student learn has been the college's Developmental Studies Division. The basic principle on which the Developmental Studies program is based is that ambitions and capabilities of each student are different, and that for an educational program to be meaningful, each student must be dealt with on an individual basis. The program features completely individualized instruction, student tutors, non-punitive grading, a flexible calendar, and motivational techniques packaged so as to focus on the individual learning capabilities of each student. The basic educational program is dovetailed with such activities as extensive counselling, student activities and cultural activities in an effort to interest, motivate, and develop each student enrolled in the program.

Of interest is the fact that the Developmental Studies staff were convinced that the students should not be required to needlessly cover any previously mastered course material. Therefore, entering students are tested in each area to determine their performance level. After this level is determined, they are placed in a unit in which they can reasonably be expected to proceed. We emphasize pre-testing quite heavily — we have five counsellors, and three of them work solely with the Developmental program.

Chart 1, entitled "Different People Learn Differently" demonstrates the different means available to the students to help them achieve unit mastery. The diagram illustrates how the learning capability of each student is dealt with on an individual basis. Each course of instruction is composed of a sequence of individualized units with the student being placed in the appropriate unit on the basis of a pre-test.

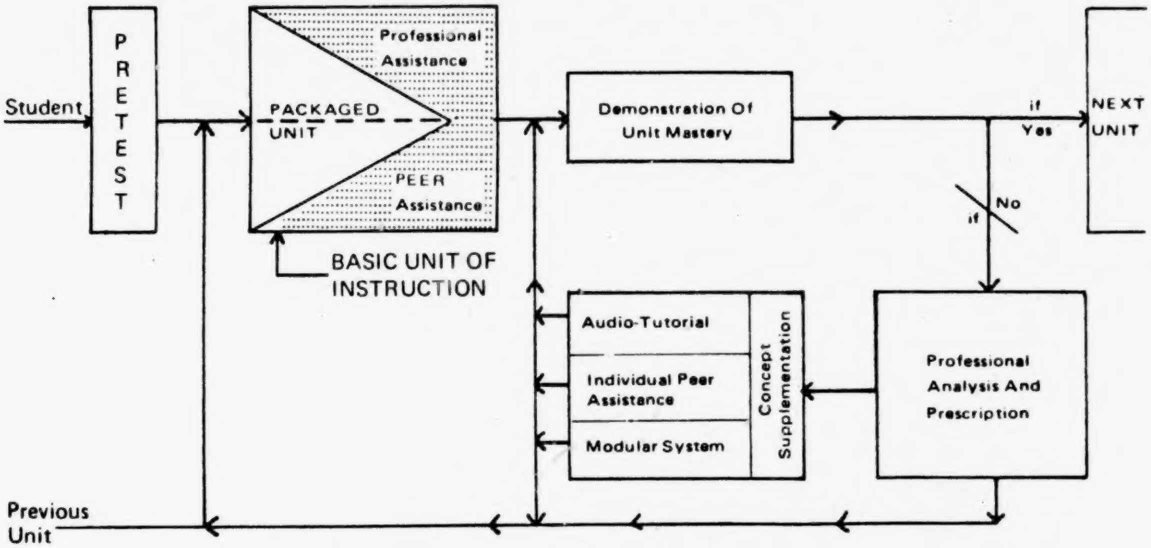
Student
PRETEST
Professional Assistance
PACKAGED UNIT
PEER Assistance
BASIC UNIT OF INSTRUCTION
Demonstration Of Unit Mastery
if Yes
NEXT UNIT
if No
Audio-Tutorial
Individual Peer Assistance
Modular System
Concept Supplementation
Professional Analysis And Prescription
Previous Unit

Chart 1. DIFFERENT PEOPLE LEARN DIFFERENTLY

We have had tremendous success with student tutors. We are working on a Federal grant, and I think right now we have something like 25 student tutors working in Developmental programs. I am sure you will agree that many times you and I could sit down with a student and tell him what's right and what's wrong and it goes in here and comes out here, where a kid his own age, a student who has excelled in that particular field, can sit down and really get more done than you or I.

After working through the self-instructional unit at his own pace with professional and peer assistance, the student is tested to determine if the objectives have been mastered.

The student's performance is analyzed and supplemental work may be prescribed by the professional teacher. Supplemental work may include a different approach to a particular concept, a complete reworking of the unit, or going back to a preceding unit in the sequence.

If a particular concept has been missed, the professional teacher may prescribe either audio-tutorial instruction, modular instruction, or individual peer assistance to approach the concept in a different manner. The manner chosen depends on the professional judgment of the teacher, who has additional insight into the student's learning capabilities because the instructors also serve as counsellors. The audio-tutorial instruction employs film, film strips, slides and tapes. The modular system may be programmed units, while peer systems may include individualized units or group discussions.

PROGRAM EVALUATION

In evaluating the program, the college has considered faculty reactions, effect on grade point averages, student mastery of stated objectives, student reactions, and continued evaluation of measurable progress towards the college's prime goal by the college's Dean of Instruction, Dr Walter Palmer, and the Educational Development Officer, yours truly. The Educational Development Officer for Instruction is another ideal of the Junior and Community College Division of the NLHE. The EDO is the internal staff member who specializes in instructional technology and strategies for constructive change.

Faculty reaction has been solicited by periodic anonymous questionnaires, while student opinions have been secured through random sampling. The real effect (or success) of the program has been determined through the evaluation of student mastery of course objectives over several quarters while taking into account the student characteristics as well as instructional techniques.

An evaluation by the Educational Development Officer of the courses to be offered in the 1971 fall term showed that 87 percent had been developed based upon specific behavioral objectives. This has been increased significantly since that time. Also, 85 percent of the courses had been developed with a variety of learning activities included, and in most cases this represented a second or third effort in establishing an optimal sequence of those activities.

In the fall of 1970 an anonymous sampling of the faculty opinion regarding the implementation of the systems approach to instruction was secured through a questionnaire. Ninety-seven percent of the college's teaching faculty indicated they felt that the utilization of specific behavioral objectives had improved the instructional program at the college, and the development of these objectives had taught them something worthwhile about teaching and learning. Also, the majority indicated the desire to implement the systems approach to instruction in their own courses.

Presently, all our instructors are involved in the systems approach, and 62 percent are involved in individualizing, if not the entire course, then key concepts within the overall systematized approach.

The student reaction to the use of specific behavioral objectives has been most favourable. Sampling of opinions from students that took the courses that use objectives indicated that virtually all felt that this approach assisted them in mastering the courses. Mastery means getting an A or a B. Nothing else. If they make a C, or anything below, they are re-cycled to do it again. Students were especially enthusiastic about having these objectives made available to them at the beginning of each instructional unit.

During the 1970-71 year, Wytheville Community College was selected as one of the 100 colleges to participate in a national evaluation funded by the Kellogg Foundation and conducted by the American Association of Junior Colleges as part of Project Focus. Community college students and faculty members participated in institutional self-study using instruments provided by the American College Testing Program. The evaluation revealed that the Wytheville Community College students found that a majority of the college's teachers (1) prepared materials in a more organized and precise manner (a natural outgrowth of the systems approach to instruction); (2) encouraged student participation in the classroom; (3) cared if the material presented was understood; (4) distinguished adequately between major and minor points; (5) were not uneasy or nervous; (6) did not criticize or embarrass students; and (7) were in touch with student life. Also, a vast majority of the students indicated that the academic advising program by the faculty and counselling provided by student services personnel were extremely valuable and worthwhile.

As a result of the improved learning (as measured by student performance), an analysis of the grade point averages for selected courses and for the entire instructional program has been developed. Examination of the distribution of grades for the total student body has revealed a trend toward better grades each quarter even though there has been no substantial change in the student body as characterized by class standing, standardized test scores, etc. In addition, a substantial number of faculty members feel that students in their classes are mastering the material better and that this is reflected in better grades.

A year-long evaluation of the grade point average of one instructional department which utilized a systems approach to instruction extensively, and which also offered courses across the breadth and depth of the student body, indicated that a 15 percent increase in the grade point average occurred for all students in all courses in the department. The department (from which each regularly enrolled student must take at least one course) observed that the student grade point average increased from 2.13 to 2.54 over the one-year period although no substantial change took place in student characteristics. This same phenomenon has been observed in other departments in varying degrees.

It is also significant to note that the failure rate (D's and F's) fell from 19 percent in the winter quarter of 1970 to 14 percent in the winter quarter of 1971. The percent of absolute failure (F's only) fell by almost 50 percent from 7.4 percent F's to 4.0 percent F's during the same one-year period.

In an effort to determine if a positive relationship existed between the implementation of the systems approach to instruction and the improved grades during the 1970-71 school year, the EDO divided the faculty members into three groups. Three classifications were established based on whether the faculty members' implementation of the systems approach was normal, substantial, or extensive. The percentage of A's and B's (a definition of course mastery) for the 1970-1971 and 1969-1970 years was computed for each group.

Figure 1 shows the relationships between these variables and dramatically points to the increased percentage of students mastering the course through the systems approach. During the 1969-1970 year before extensive development of the concept, there was little difference between the three groups of faculty. The students of the two groups classified as employing substantial or extensive use of the systems approach, show a substantially higher degree of course mastery for the 1970-1971 year than did the third (nominal) group. They also show a substantial increase in course mastery over the 1969-1970 year.

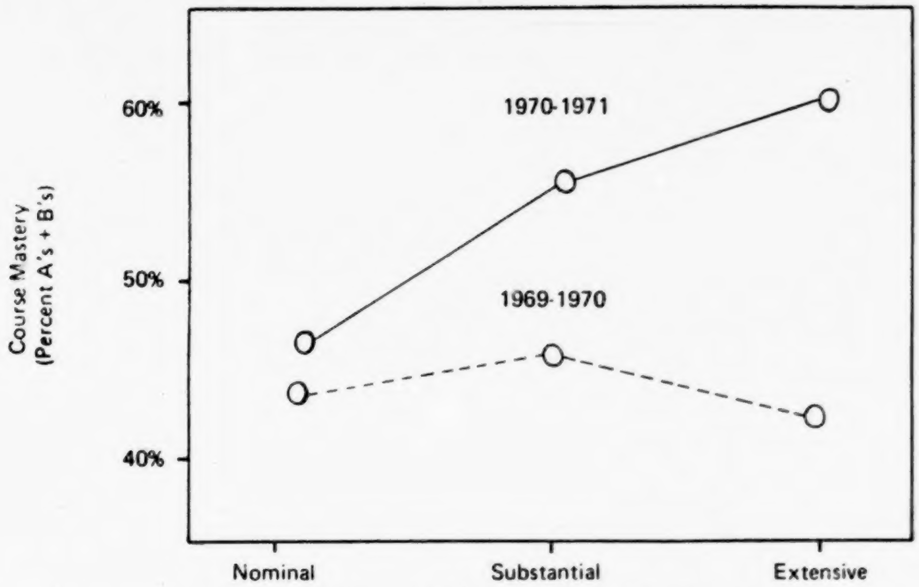

Figure 1 - Instructor Groups by Degree of Use of Systems Approach
UTILIZATION OF SYSTEMS APPROACH VS. COURSE MASTERY

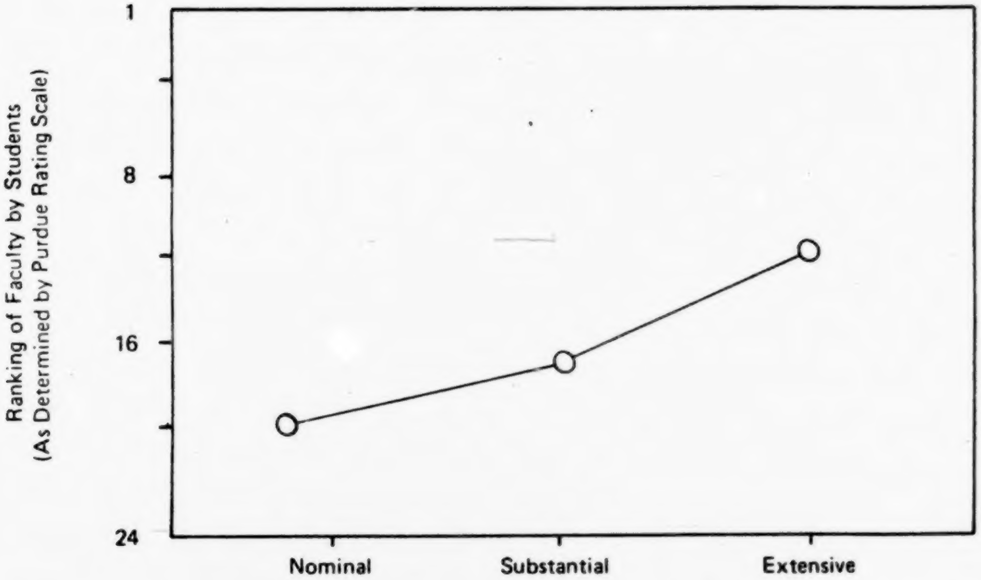

Figure 2 - Degree of Use of Systems Approach By Instructor Groups
DEGREE OF USE OF SYSTEMS APPROACH VS. STUDENT RANKING OF FACULTY

To determine what the students thought of these new instructional techniques, the average rankings of the three groups of faculty (as determined by the local norms generated by the Purdue Rating Scale of Instruction in the spring of 1971) were compared as shown in Figure 2. The results indicate a definite appreciation of the systematic approach to instruction on the part of the student. (Note: A high score on the Purdue Rating Scale indicates an unsatisfactory rating, and a low score represents a favourable rating.)

A number of conclusions and implications for colleges can be drawn from these data. First, it must be recognized that if both faculty and students think that a systematic approach to instruction improves the teaching learning process then this feeling partly validates the basic assumption on which the program was built. Beyond this simple validation the conclusion has been further strengthened at Wytheville Community College by empirical data which demonstrate that course mastery is increased through use of the concept.

Several questions can be put forth about these results. Could the improvement in grades be attributed to easier grading on the part of the faculty? Could the increase in grade point averages be related to better students in the individual classes as a result of improved placement through the counselling services? How many students are graduating, and, how are the graduates of the college performing?

To the question, "are the faculty members grading easier?" individual faculty members said no: In fact, some instructors who have continued to use standardized tests keyed to a basic text over a number of years have witnessed notable improvement in grades. However, it should be noted that in developing a limited number of specific behavioral objectives for a course one may effectively reduce the scope of the course and consequently narrow the scope of the learning process. The college's faculty have indicated that they are aware of this possibility and are considering it as they develop the instructional program.

During the 1970-71 school year there was an improvement in the placement through counselling; however, the conclusion was that this had done more to reduce the percent of failures than to increase the percentage mastering the courses at an "A" level. This resulted in skewing the grade distribution to the right.

To consider an important indicator of a college's increased effectiveness, a report on the follow-up studies of all students at Wytheville Community College during the 1969-1970 year revealed that 195 out of 726 full-time students entering in the fall of 1969 achieved their educational objectives (not necessarily graduating) at the college during that year. By projecting this figure to a two-year period ending June 1971, it was found that more than 70 percent of those full-time students who should have completed their objectives did so. These percentages compare very favourably with those in most other colleges. (Note: California Legislature. The Academic State. Sacramento, California, 1968)

Also, in terms of the percentage of annual full-time equivalent students graduating it has been determined that the percentage was 8.4 in 1967-1968; 17.2 in 1968-1969; 17.8 in 1969-1970; and 22.7 in 1970-1971. One will notice that there is constant improvement year by year.

Wytheville Community College students are getting better and better grades; more and more are graduating; and a higher percentage are achieving their educational objectives. But what about the performance of those graduates? The 1968-1970 follow-up study found that former Wytheville Community College students are in fact performing well on the job and at four-year colleges in the case of transfer students.

GILLEY..cont'd

The records of the 89 students transferring in 1968 and 1969 showed a slight grade point drop in their first term as compared to their WCC averages. Two years later the same 89 had a composite grade point average of 3.200 at senior colleges compared to their average of 2.717 for their two years at the community college at the time the survey was completed in 1971.

Likewise, the success of those going directly into the world of work from the college has been documented. This documentation has drawn widespread comment attesting to its quality. (Gilley, Wade J. and Norene Holston. Three Years in Retrospect: A Follow-Up Study of Graduates for 1968-1970. Wytheville, Virginia: Wytheville Community College, June 1971.)

Whether or not the college's graduates will continue to perform as well as they have in the past is a question to be answered by future studies. These studies will be conducted because the first of six points in the college's accountability development program is the requirement of an annual follow-up of all students leaving the institution. However, every available indicator would point to improved performance on the part of those going to the world of work or to senior colleges and universities.

In the future the college plans to work toward improvement in the learning process through continued emphasis on a systematic approach to teaching. The development of the program will feature in depth evaluation of the products and productivity of the college, an orderly move toward direct measurement of teacher effectiveness, and the continued development of a sense of accountability for student learning on the part of all persons associated with the college.

DISCUSSION

Question:

Were student peers trained or given any kind of orientation program before they were allowed to come into contact with other students to help them?

Answer:

Yes, they were trained by the Developmental faculty in each area - Math, English or Reading. They were working under a Federal grant and were paid $2.00/hour. They go through a one week orientation session before the term starts. These are advanced students in each of their areas, naturally, or they would not be student tutors, but they are still checked out to make sure they understand the concepts and principles so they can help the students.

Question:

Do you have the Developmental program scheduled or is it a continuous thing?

Answer:

Students come in any time they can but they have to be there a certain number of hours to complete the course. There is no time schedule; they just have to complete the course satisfactorily and then either another unit is prescribed or they are put into the regular program.

Question:

Do you test all of your objectives?

Answer:

No, I don't think you can test them all. A course may have, if it's properly developed, several hundred objectives. It would be impossible to test them all, but I think it is necessary that the students have a copy of the objectives at the beginning of each unit. I think it takes the guesswork out of education. I know when I was in school, which wasn't all that long ago, when you studied five hours for an exam, you maybe studied four of those hours trying to out-guess the teacher - did he emphasize this point so much that he is bound to ask a question on it? In those four hours when you are trying to out-guess the teacher you're not learning anything.

GILLEY..cont'd

I think objectives obviate that problem - in fact they eliminate it.

Editor's Note:
This paper has been published in slightly expanded form as: J. Wade Gilley and Terrence A. Tollefson, *Products and Productivity: A Perspective on Learning*, Durham, N.C.: National Laboratory for Higher Education, 1972.

TEACH-THROUGH-HARDWARE

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INTRODUCTION

Year after year a teacher faces a large body of students who are thoroughly bored. If there are a few interested bodies amongst them the teacher knows very well that they are either mature students or students who have gained some useful work experience in business or industry and they are there for the sheer business of learning and improving their chances. In general, most students are there solely for the purpose of gaining an educational experience or even more precisely to gain a paper - called a certificate, a diploma or a degree - which their parents want them to gain or perhaps, their would-be employer expects them to have.

The teacher tries to get them interested in the subject of his speciality, first perhaps by talking or lecturing to them. He might think they are listening to him and perhaps gaining some inspiration. Ah! No sir! Most of them are completely turned off!

The teacher might try another way of inspiring them. He may prepare notes, of course incorporating all his wonderful, beautiful and fantastic educational objectives with a view to get them interested in a very short period of time - say 6 to 8 minutes in class and then hand out his carefully and lovingly prepared notes with the hope that the student would read in his own good time and hence learn to 'dig'. The teacher is usually wrong to assume that the student would read. The students usually file their notes for future use, perhaps - for exam purpose and not read at all - as they usually have no time to read or say even to just browse through before the next class meeting. In the end the teacher's effort in preparing the notes becomes a big waste of time except, of course, the notes serve the purpose as a quick fact-finder just before the examination.

The teacher might try a different approach this time. He may set objectives or goals for his course and perhaps ask the students to go away and learn by themselves in rough self-study, investigation and research. In this case, of course, some students learn an awful lot - perhaps much more than the teacher - and others have a way of doing the very minimum to pass and some have a way of somehow sailing through the whole thing.

How to spark the student or fire his imagination becomes a big question in the teacher's mind.

As I see it, the teacher is not an information bank who dispenses large doses to meet individual student needs, but is a person who fires the student's imagination and gets him interested in a subject and keeps him going at that. Once the teacher has done that the student is capable of teaching himself - by doing this, the teacher in fact opens the door to self learning. Teach-through-hardware is intended to do just that. Pose the student a problem - give him all and everything he needs to solve the problem through one or more medias available - of course making sure the instructions are well programmed with a view to making the student achieve results. Achievement is extremely important from the point of view of motivating him, making him more receptive and finally to make him want the theory.

With these thoughts, a better skill, with these kinds of frustrations, about three years ago I embarked upon devising ways and means of getting involved and also interested in whatever I was asked to teach.

Teach-through-hardware, as I call it, is a teaching technique. It demands attention and challenges the student right from the start and expects him to use not only his hands but also his head by posing a problem. When he has achieved some useful and meaningful result of his own, the teacher steps in and helps him to explore the related theory.

This teaching technique consists of two parts: a self-learning part and a lecturing part. Self-learning will take place during the process of putting to use the information and instructions provided through the visual media for manipulating the hardware. The visual media, in the form of 35mm 2 x 2 slides, is the main source of information and instruction. The visual media is preferred because it develops terminology, thought,and gives sufficient time for the student to interact and to use his hands and head and eventually produce results with the hardware.

Hardware is the apparatus, or the machine, or the microscope, or bits of wood or lumps of metal, or whatever the teacher chooses for his students to work with. Hardware is the solid media which the teacher intends to use for explaining or relating the theory. It is the learning media or a means for exploring theory and is quite distinct and must not be confused with the visual media. After a period of self-learning and at the completion of the experiment or task, the teacher uses the same visual aids and hardware and also whatever the student might have produced to explain the related theory. Practical work with the hardware and self-learning comes first. Theory then follows. This teaching technique also enables the teacher to look at the subject matter in two different lights - the routine stuff and the live matter.

Most of the routine stuff could be put on slides. The live matter could be continually worked with and improved.

This teaching technique is neither old nor new. Perhaps it has been tried by many in several fields in different forms. In attempting to teach using this technique, I do not claim to have carried some original work of any special value.

However, I would like to think that I have found a way of combining the conventional laboratory instruction and instruction through visual media together - and, of course, taking advantage of the human weakness for watching television - for motivating the students of our affluent society. It works for me.

I have tried a few of these programs on guinea-pigs such as students, teachers, salesmen and laymen and the results are found to be very satisfactory.

OBJECTIVES

In planning, producing and evaluating a few programs, about six of them, the following have been foremost:

1. To motivate the student in the right direction.
   Teaching dry theory with chalk-and-talk is not effective.
   It leads to learning the facts in a parrot fashion.
   Learning just dry theory does not excite student interest or help retention. In fact, it kills it.
   Practical work based on hardware is intended to prepare the student before preaching and to carry out all the necessary spade work before exposing the student to the deeper aspects of theory.

2. To minimise repetition on the part of the teacher of the specific information and instructions on a particular piece of hardware and its related equipment.

3. To provide the student with the information and program all the instructions relating to what needs to be done with the hardware and the sort of information he is expected to collect and record and, more importantly, to stop the student from saying, "I made a botch-up because you didn't tell me what the hell I am supposed to be doing in the first place".

4. To enable the student to experience a practical problem similar to the one he might come across later in industry.
5. To expose the student to the related terminology and to make him produce some kind of tangible result at his own pace before proceeding to learn the related theory.

HOW IT IS DONE

The student is posed with a problem or an objective. He is challenged to achieve and produce results which in turn will enable him to earn his credit. He is asked to solve the problem, or achieve his objective by carrying out a clearly defined experiment or a task. To carry out the experiment or task he is given the hardware and its related equipment, information about them and well-sequenced instructions for manipulating them. Information about the hardware and operating instructions are contained in the visual media - 35 mm 2 x 2 slides. A program may have anywhere from 50 to 2000 slides depending upon the complexity of the subject matter in question.

The slides are usually sorted out, arranged in a sequence and placed in one or more carousel trays. Slide sequencing is extremely important as it is intended to provide specific and well-timed information and also step-by-step instructions which in turn cause him to interact and produce results. If this can be done effectively the student is left to himself until after he has produced some results.

The slides in the carousel trays may be divided into three parts: Information slides, Instruction slides, and Demonstration slides.

Information slides are intended to supply specific, unclouded and well-timed information in order to develop terminology, thought and prepare the student's mind for some action. It should tell him the 'whys' of the operation, and expose him to the terminology and its spelling of the subject matter. If the right term is brought in front of the student at the right place and at the right time, that is near the specific hardware, the student will learn the subject matter very quickly.

Instruction slides are intended to provide a battery of sequence for events that are necessary for the manipulation of the hardware and its related equipment which will enable him to produce and record meaningful data, or information or a tangible result. This tangible result may be in the form
of a graph
or a photomicrograph
or a table of values or figures
or calculations
or figures from chemical analysis
or hand sketch(es)
or drawing(s)
or finished workpiece(s)
or a written report
or conclusions based on their learning experience.

Instruction slides, in general, provide information about 'when' and 'how' of any operation or manipulation.

Demonstration slides are intended to show the action of what might and should happen and also what could go wrong during an operation or manipulation.

The net effect of all the slides when put together is to help the student to think through the problem and achieve results. Many a slide when looked at singly may appear to be meaningless or perhaps far too elementary from the point of view of an average student. Each separate slide by itself may appear to look down upon the intelligence of an average student. But, in its own specific place on the carousel tray it not only tells a complete story but also is intended to induce action.

Just viewing the slides without the hardware could become very boring. However, the information on the slides is used and the student interacts with the hardware at the same time, to produce results and also will impart a sense of achievement.

Completing the experiment or task will certainly enable the student to gain satisfaction.

The very act of doing calls upon him to use his hands and his head at the same time. It makes him do at least something in order to learn rather than sit back in the back bench, put his feet up, and completely turn off and display his usual callous and continued serenity - in other words, complete and total disinterest.

This teaching technique has been a good motivator of students. It has certainly made many slow and unmotivated students spring to action.

The self-teaching part of this technique prepares the students and makes them want the theory - or at any rate, it certainly makes them more receptive to new concepts. The self-teaching part is the routine stuff in the carousel tray in the form of slides and this enables the student to go over the ground several times at his own pace and in his own good time.

SUCCESSFUL PROGRAMS

The programs listed below have been found to be successful. Editing and rearranging of the existing material should produce complete and self-contained packages for in-class lectures and discussions and also laboratory work.

1. Tension testing of materials on a Tensometer.
2. Chemical analysis of steels for carbon content.

3. Chemical analysis of steels for sulphur content
4. Preparation of metal for examination - cutting, regrinding, polishing and etching.
5. Metallurgical microscope examination and photomicrography.

These packages I produced contain all the information to the last detail for completing the experiment or task. These packages eliminate the supply and perhaps the use of laboratory work sheets, indecipherable or unreadable laboratory or instruction manuals. Generally, students are too lazy to read them and they do not make full use of them.

As the carousel tray contains every piece of information required, students can set up their slide projectors by the side of the hardware and commence performing the experiment or task without intervention from any other person, including the teacher. The teacher's time may be well occupied in guiding and supervising several experiments or tasks at the same time.

I usually recommend to the students to spend some time viewing the slides, usually a week before the actual day of the experiment. This helps the students to prepare themselves for the experiment and assists them in collecting and putting together all the odds and ends and supplies for the experiment or task. All this perhaps equips the student with some prior knowledge and gives him a general idea of whatever he is supposed to be learning or looking for.

SCOPE

As I see it and as many of my colleagues have begun to appreciate, there is tremendous scope for the application of this teaching technique.

Teach-through-hardware techniques can be used in almost any field where some kind of hardware is being used for instruction - be that hardware a sewing machine, a typewriter, a camera, a car, a computer, a lathe, a milling machine, chemical or physical or metallurgical apparatus, or measuring and scientific equipment.

Within the fields of my interest I would like to produce programs on the following topics:

1. You are going to buy yourself a lathe.
2. Technology of operation of a lathe-turning.
3. Technology of operation of a lathe-taper.
4. Technology of operation of a lathe-screw cutting.
5. Cutting tool technology I.
6. Cutting tool technology II.
7. You are going to buy youself a milling machine.
8. Technology of milling machine operation I.
9. Technology of milling machine operation II.
10. Production milling business.
11. Drilling time.
12. Technology of turret lathe in large quantity production.
13. Measurement of length - Gauge blocks (English & Metric).
14. Micrometer reading (English and metric).
15. Micrometer calibration.
16. Hardness testing of materials I.
17. Hardness testing of materials II.
18. Fatigue testing of materials.
19. Impact testing of materials.
20. Torsion testing of materials

- - - and many more.

NOTE: Items 2 through 12 are intended for technician and technology programs. They are intended to help the student to explore concepts in the field and not for developing any special skill.

Quite a few of my colleagues in our college and other colleges in Ontario have shown interest in applying this concept. Some have tried them with some degree of success. Some have requested my help and some have asked me to act as a sort of consultant for producing programs relating to their piece of hardware, such as a calculator, a typewriter, an electron beam welder, and photographic equipment.

A few people connected with technical sales have also commented on the potential of this technique. As they see it, if used for selling things the technique certainly enhances the sales potential of their products.

WHAT'S IN THE BAG

For those teachers who may want to embark on something like this I am afraid I have nothing to offer but hard work. Programs will have to be carefully selected and thought out in rough as regards their contents, objectives, methods, sequence and plan - all of which is very time-consuming. To give you some idea, a rough estimate could fall in the range of 150 to 250 hours per program. I should say that programs are to be developed over a period of one to three years, as this would give an opportunity for continued research requirement and evaluation. The most time-consuming parts of it for which you cannot account are the evaluation, rearranging and re-editing of the slides. As an example, the details of production of slide material are as follows:

1. 40 to 50 hours of research work spread over several weeks.
2. 30 to 40 hours of script writing and material preparation spread over two weeks.
3. 25 to 30 hours of photographing and directing with the right kind of technical assistance spread over a week.
4. 30 to 40 hours of editing, arranging and rearranging and evaluating the material produced, spread over three weeks.

This is a rather conservative estimate based on some experience. It is also based on the assumption that research materials, hardware and related equipment may be bought, or somehow acquired or obtained on loan.

Time is the essence. Moral support and the financial help required for the programs will ease the burden of loneliness of the road you may want to hack.

Some teachers have tried the programs. Most of them have experienced the learning situations these programs create. They have all commented to the effect that they could do with something like this or that they could use parts of it.

CONCLUSION

In conclusion I would like to stress these five points and would ask you to give them your careful consideration.

1. Students who are exposed to this teaching technique are capable of gaining their own learning experience. As a result they not only become confident about a subject matter but also find it easy to face a test if required. The test may be either a multiple choice, computerized type or even perhaps a descriptive type of test based on their learning experience. I devised tests of both kinds and found the students' retention is of the order of 75 to 85 percent.
2. This teaching technique also exposes the hidden capabilities of some students who are given to understand, perhaps by parents or teachers or fellow-students and workers, that they are total write-offs or good-for-nothings or, quite simply, 'bums'. In my experience quite a few students have gained a 'spark' or a way of finding their own way of learning. In other words, they have become aware of their learning capacity, despite the other problems they may have.
3. Most scientifically and technically oriented subjects and certainly all skill-oriented subjects can be approached through hardware. Some experience has taught that most subjects, depending upon the level of treatment desired, could be boiled down to about ten programs per semester. Students could be asked to work through them with minimum help and a

lot of direction, guidance and inspiration - and this is a way of helping them to teach themselves. In programming and producing the material outside the class, the teacher becomes completely familiar with the material himself and becomes quite in tune with the subject matter. While he is in class, a laboratory, or any work place, he will be there as a guide, or a resource person, and can quite easily help the student who may require more than average help.

4. I personally found the student learning time is greatly reduced. Taking the example of my program on tension testing of materials, I would like to make these observations. Before approaching the subject matter through this teaching technique, it used to take about 10 hours either in class or laboratory and perhaps about another 5 hours outside class of the student's time to learn - altogether 15 hours. At the end of the 15 hours there used to be a lot of grey areas. After I started to use this teaching technique, the student learning time was reduced to 3½ hours. In addition, as an offshoot, this teaching technique bottles the routine shift for the teacher and keeps it ready for his use as and when the situation may demand.

5. This teaching technique has not only helped many students as regards their retentive capacity, but also has promoted classroom discussion, instant curiosity and, of course, leads them to ask intelligent questions. Finally, all these work for me and it does not necessarily mean that it would work for others.

Ability to make it work will certainly depend upon the teacher, his background, his experience and his enthusiasm to achieve with his students.

Student achievement also becomes teacher achievement and certainly it is not the other way round!

What the student is capable of doing in class, in the laboratory and perhaps later when he gets into business or industry is more important that what the teacher can achieve for himself.

This teaching technique I am sure motivates the students, prepares them to learn theory, makes them more receptive to new knowledge, creates room for in-class discussions, and finally provides scope for curiosity, investigation and continued research.

I ask you, are these not some of the many educational objectives? To these ends at any rate the teach-through-hardware technique has been found to be extremely useful and, of course, successful.

INDIVIDUALIZED LEARNING PROGRAMS AND THEIR EFFECT ON LEARNING RESOURCE CENTRES IN THE COLLEGES OF APPLIED ARTS & TECHNOLOGY

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Planning Guidelines for College Resource Centres

Goals and Objectives of Colleges of Applied Arts and Technology (Appendix B), states that "the main educational building of the future should be a resource centre, housing resource people, libraries of books, TV, tapes, and all other AV equipments." Further, it goes on to stress that "The use of technological aids should be predicated upon the prime objective of permitting the individual to learn at his own speed, in the environment most readily accepted, and at a time most convenient and opportune for him." The same points were made on this theme in the Brief Submitted to the Commission on Post-Secondary Education in Ontario, by the Committee of Presidents of the C.A.A.T.'s. For example: "Information should be stored in (one of) many ways to permit access by students, to as many replays of information as required. This would permit the student to study at home or at carrels in the library, depending on the information storage and retrieval method(s) used."

This concept for a college resource center will be recognized by most C.A.A.T. librarians and AV coordinators as somewhat utopian. Between the years 1967 to 1970 very little was done to promote these plans. Beckman has made some very incisive observations regarding the present state of L.R.C. in the colleges. ". . . they don't even begin to approach that role. . ."[1]

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1. M. Beckman - The Learning Resource Centre in EA 20 CAAT Design Workshop, 1971.

The C.A.A.T.'s were not the only institutions who were having trouble implementing plans for integrated resource centres. Witness in fact the initial exuberance of the combined A.L.A. and N.E.A. (D.A.V.I.) standards published in 1969. These standards described the personnel, resources, expenditures and facilities for unified media programs. However, some reservations were made even at that time. "The commentary accompanying the standards does not represent a complete description of the . . . organization, administration and operation of school media programs."[2]

The above statement was an understatement. During the following two years criticisms began to appear in publications. Comments were heard at conferences regarding the practical difficulties of getting library and AV personnel to work in harmony. That is, comments were made after the initial shock of having their leaders join hands and publish joint standards had abated.

This problem with personnel still persists in many institutions. It is a very real factor even in the new colleges because the entrenched disciplines predate the colleges. The library was oriented toward the individual learner. The AV department was a technical aide to the teacher - essentially an information broadcaster. Communication, one-to-one and communication one-to-thirty, differs not quantitatively but in kind. Hence the dichotomy in concern, perspective and applied action between the librarian and the AV director.

Some Difficulties in Implementing the Planning Guidelines

However, at least three alleviating trends are modifying the orientation of AV personnel. First, the size of AV departments has increased rapidly. With the ensuing increase in complexity there has arisen a corresponding need for administration by professional media specialists. These

2. Standards for School Media Programs, p.XIII

specialists often are former teachers with at least equivalent academic qualifications to other faculty. Thus the AV departments can become more teacher-curriculum-student oriented rather than merely a clique of camera clickers and projector pushers anonymous.

Secondly, the fundamental concept of teacher is changing from one of audio broadcaster with occasional sample feedback, to the idea of teacher as a facilitator of learning. The new teacher is a subject matter specialist, curriculum analyst, resource previewer-research-selector, program organizer, interest motivator, and progress evaluator. "Learning facilitators are the key to a viable learning environment. They are devoted to continuing education for themselves and others, enlightened in the execution of their responsibilities and dedicated to the principle of the fullest possible realization of individual potential."[3]

The third factor which has changed the AV department emphasis on AV technician-teacher interaction toward interaction with the individual learners is the introduction of AV equipment into the libraries, language labs and other 'learning' labs. Under happy circumstances, all hardware acquisition is centrally coordinated by the AV director. Also under happy circumstances, hardware is approved and joyously installed in various types of learning labs by various departments supplied by various AV equipment suppliers. The happy circumstances inevitably change to varying degrees of unhappiness when warranties run out and the AV department is invited to run in. The unhappiness often changes to despair when it becomes evident that different campuses, and even different departments within the same campus, all possess bright new shining incompatible equipment, harmoniously incompatible with any software held by the library. The con-

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3. Brief to the Commission on Post-Secondary Education in Ontario by the Committee of Presidents of the Colleges of Applied Arts and Technology of Ontario. June 1970.

TENG..cont'd

sequences of the resulting chaos has been a desire by college administrators to either reorganize on the basis of unified media departments or at least to foster liaison between the hardware and software people. Hence the introduction of AV personnel to the problems of libraries and learning labs and thereby a more immediate appreciation of the needs of the individual learners.

On the other hand, the effect of a massive influx of non-print media did necessitate considerable adjustments of library function. Jim Feeley, Chief Librarian at Algonquin College, feels that library functions have changed from ". . to obtain and store script and printed matter" to ". . to obtain and store print and non-print media, to retrieve and display such media, and to publish, and broadcast, and mix various media."[4]

The Department of Health[5] diagnosed six functions upon which the introduction of AV materials has caused heartburn to librarians. Storage, circulation, personnel and technical services are the more obvious. Acquisition and cataloguing have required the most protracted changes. This is illustrated by the initial experiences at acquiring non-print media by the College Bibliocentre. Cataloguing of non-print media is perhaps the most complex problem. It has necessitated the establishment of new standards and new methods of coding the various media.[6] Generally, the media have to be differentiated in accordance with the necessary type of retrieval mechanisms. However, the type of retrieval mechanism required seldom bears any relevant relationship to the informational value of the message. (McLuhan - blush!) Aside from the message, the only massage of the mechanism probably obtains from a reduction in the primitive 'knob-twiddling' drive. (Teng's Law: The greater the complexity

4. P.18, EA 20 Colleges of A.A.T. Design Workshop, 1971
5. Dept. of Health, Vol. 3. Audiovisual systems . . .
6. Jean Riddle, Shirley Lewis and Janet MacDonald. Non-book materials: the organization of integrated collections. Canadian Library Association, Ottawa, 1970.

diversity and quantity of knobs, the faster and more furious will be the twiddling.) This is an example of a phenomenon with which AV directors have struggled for many years and is now starting to plague librarians. Actually, this particular exploratory drive can be put to good use in various learning labs. It could be best utilized by designing pin-ball type machines connected to a computer. The motivational value of these gadgets is so high that students may attach themselves to a given simulation game or program for whole days at a time. Anyone who does not believe this should take a stroll through the local 'penny arcade'.

This leads to another factor which is definitely going to alter the function of a resource centre. It will literally become a learning resource centre once it incorporates aspects of language labs, reading labs, writing labs, math labs, curriculum materials development labs (for faculty), etc.

However, the major reason which has prevented adoption of individualized instruction and a systems approach has been the fear of increased costs. Bernard Trotter in his report to the Committee of Presidents of Universities of Ontario points out some of the possible implications of student-centred instruction. "The most important of these is that each student will learn most effectively through varying combinations of instructional resources. Some will be self-sufficient in a library. Others need constant guidance in using the library effectively. Others require dialogue with other students and instructors. Others require a degree of competition to spur performance. Some need almost constant feedback and assurance. Others may be self-confident enough to follow an entire course of study without formal evaluation."[1]

In this context, individualized instruction means

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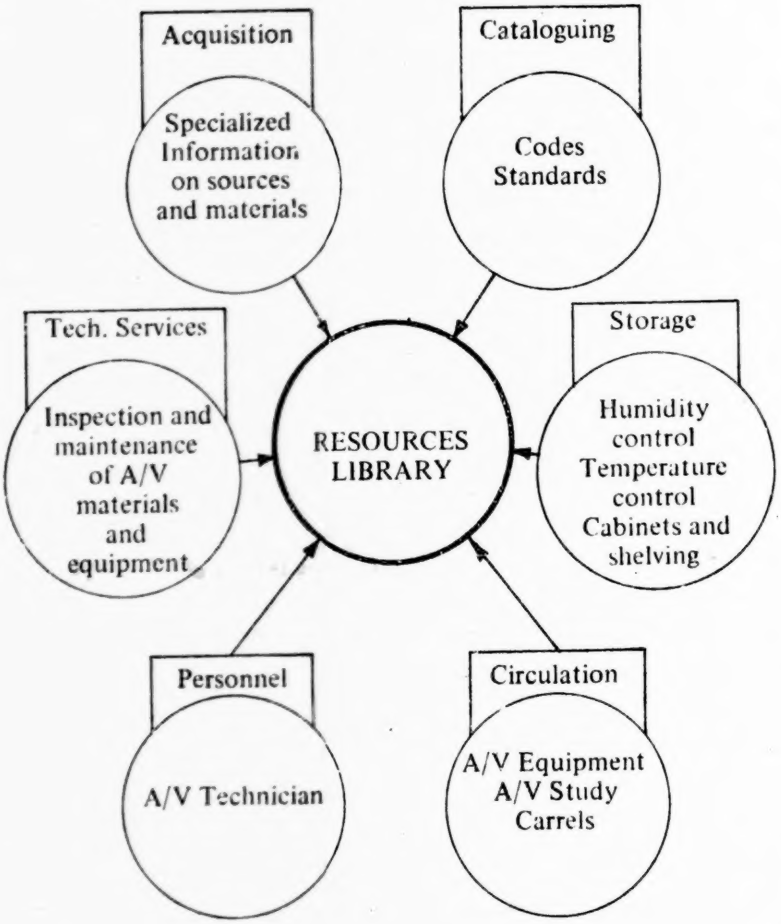
1. Trotter, B. Television and Technology in University Teaching. p.13.

promoting a student to discover and utilize his own optimum mix of media resources at his own optimum pace. It is thus obvious, as Trotter points out, that the ". . administrative and logistical implications of truly individualized instruction are mind-boggling."

THE IMPACT ON THE LIBRARY OF INTRODUCING AUDIOVISUAL MATERIALS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Specialized Information on sources and materials
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RESOURCES LIBRARY
Storage
Humidity control Temperature control Cabinets and shelving
Personnel
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Circulation
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Adapted from:

Audiovisual system. - Ontario Dept. of Health
Monograph #3, 1971.

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